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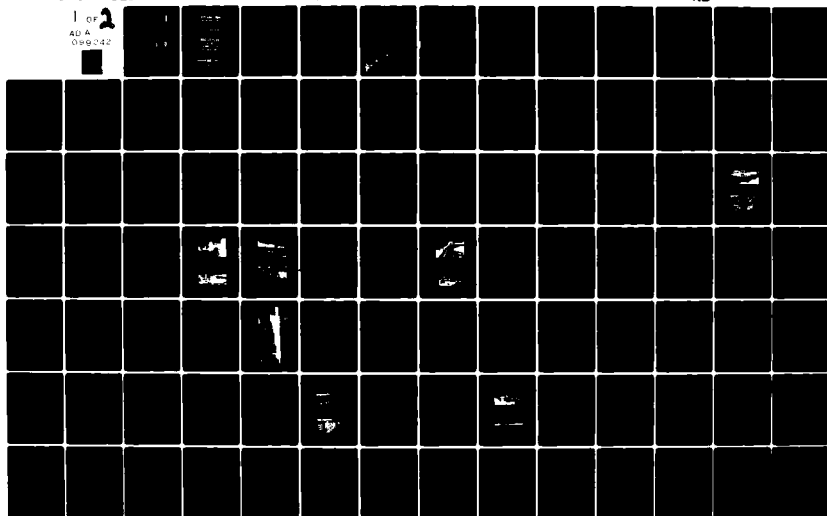
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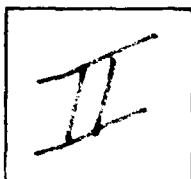
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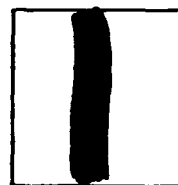
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Corps of Engineers, Waltham MA
New England Div.
Cape Cod Canal Massachusetts Master Plan
for the Development of the Recreation Resources

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Aug. - Oct. 75

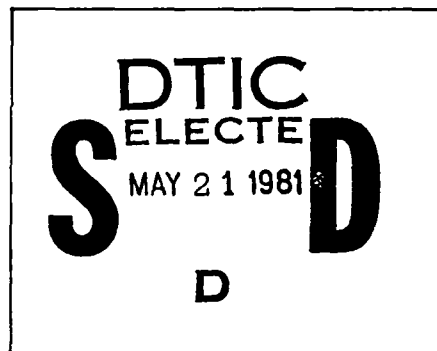
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CAPE COD CANAL MASSACHUSETTS

DESIGN MEMORANDUM

MASTER PLAN FOR THE DEVELOPMENT OF THE RECREATION RESOURCES

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM MASS IN FORCE BASE

OCTOBER 1978

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CAPE COD CANAL
MASSACHUSETTS

DESIGN MEMORANDUM

MASTER PLAN
FOR THE
DEVELOPMENT
OF THE
RECREATION RESOURCES

Department of the Army
New England Division, Corps of Engineers
Waltham, Mass.

August 1975

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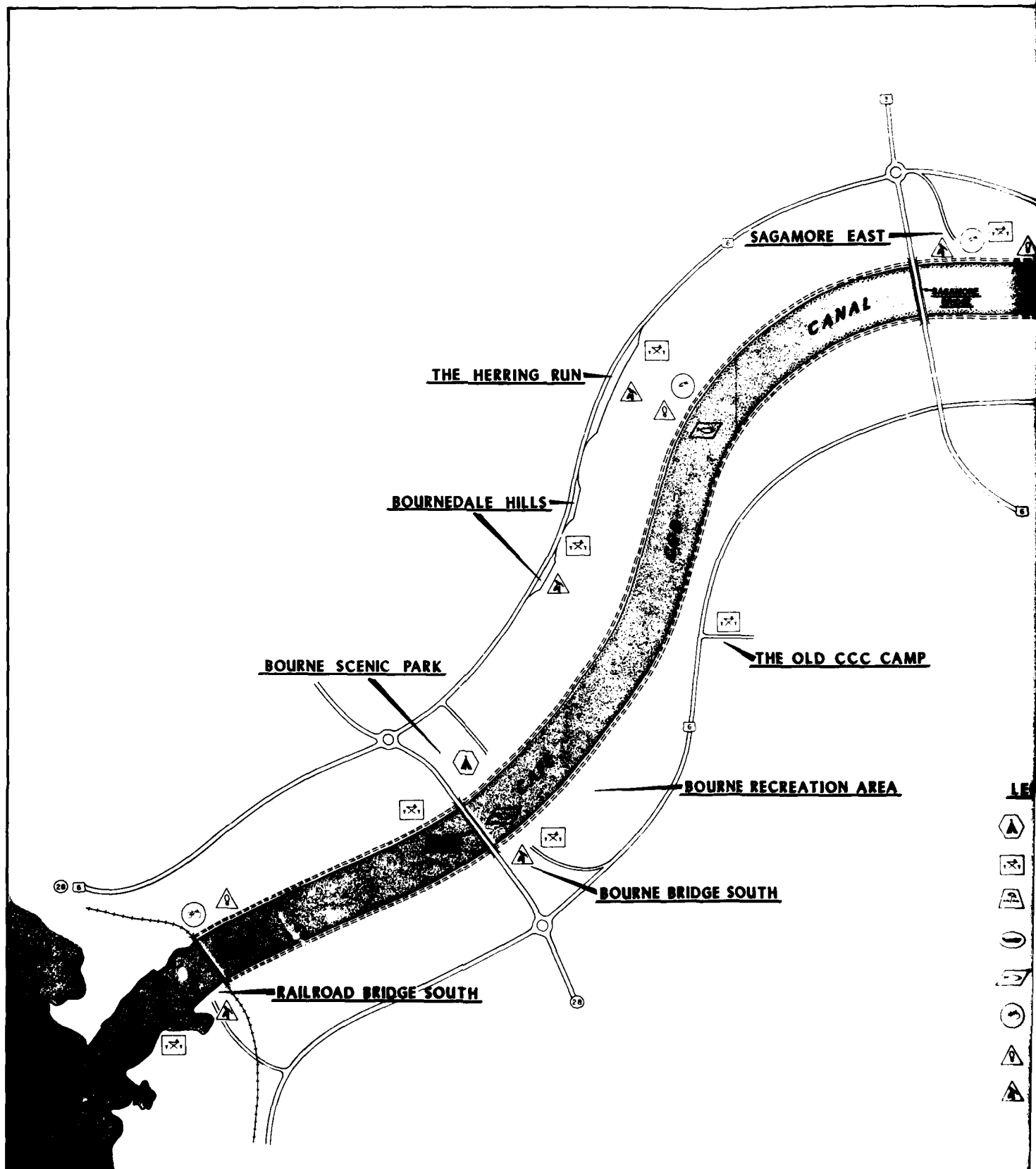
PREFACE

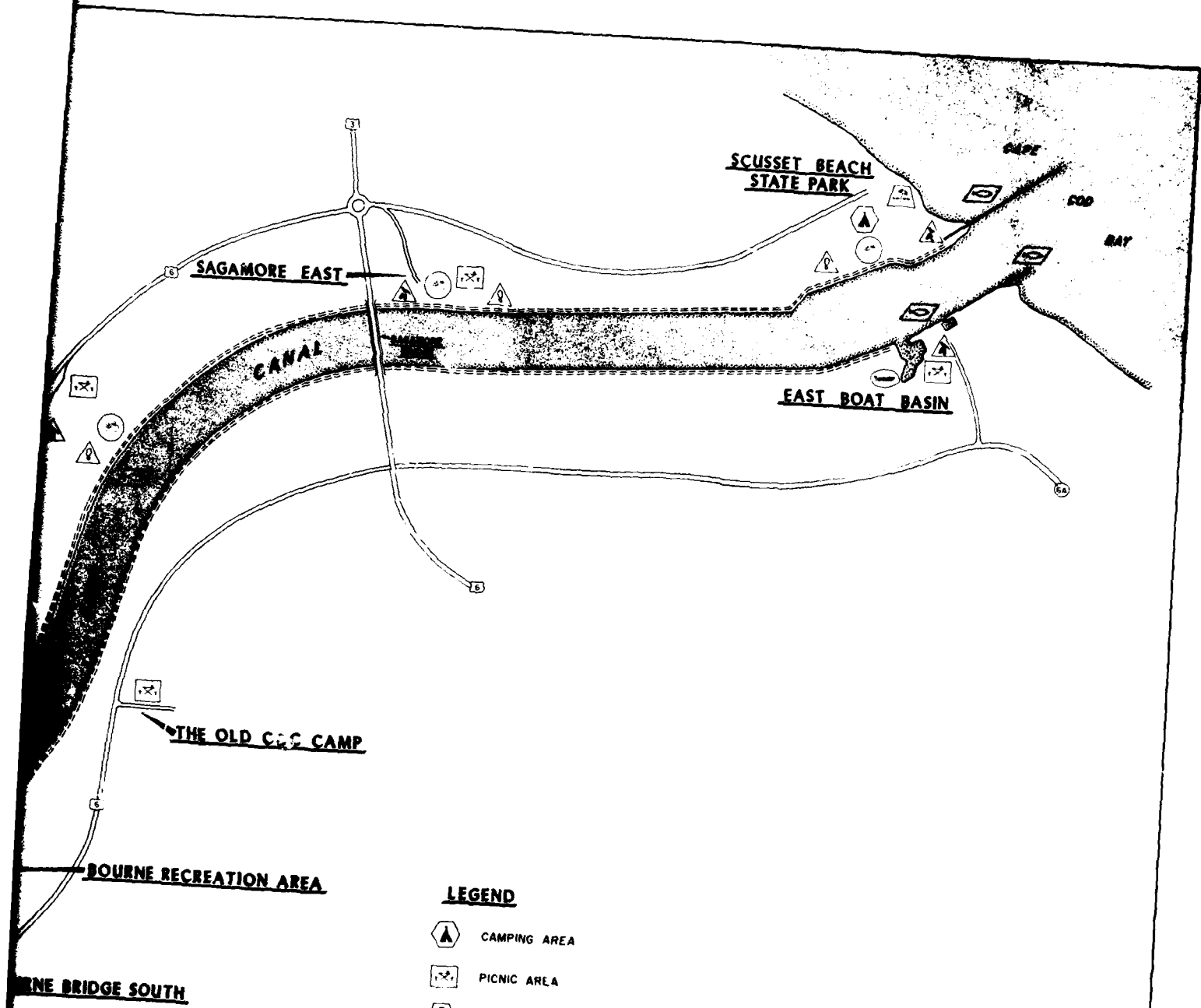
The Cape Cod Canal is known as the gateway to America's Intra-Coastal Waterways. It is also the gateway to Cape Cod, one of America's finest and most popular vacation resorts. Whether passing through the waterway, driving by it on adjacent highways, over it on either of the two highway bridge crossings or merely resting on its shores, it is an impressive sight.

During the daytime, one sees the vessels passing through the Canal closer to the eye than most have seen a vessel at sea. At night the lights along the banks form a double string outlining the "S" shape of the Canal. There is always the fresh embracing scent of salt air.

It is the New England Division's most heavily visited project as witnessed by the presence of over a million visitors annually since 1964. It is not the size but the unique setting that attracts the tourist.

The most popular activities are sightseeing, saltwater fishing, swimming, picnicking and camping. Visitors will spend hours watching the ships go by and identifying them with the use of interpretive facilities at the overlook areas. Fished around the clock, it is claimed in the local area to be the best saltwater sports fishery per mile of shoreline in the world. Access areas with picnic and sanitary facilities have been provided by the Corps to accommodate these activities.





LEGEND

-  CAMPING AREA
-  PICNIC AREA
-  BATHING AREA
-  BOAT LAUNCHING AREA
-  FISHING ACCESS
-  BICYCLE
-  WALKING
-  SIGHTSEEING

**CAPE COD CANAL
SCHEMATIC RECREATION PLAN**

DEPARTMENT OF THE ARMY
SOUTH ATLANTIC DIVISION, WASHINGTON, D.C.
BY THE ARMY
1964

SUMMARY

The Cape Cod Canal experiences the heaviest public use of all the projects administered by the New England Division of the Corps of Engineers. The number of visitors, over 1.5 million for each of the past three years, exerts tremendous pressure on recreation facilities which were originally designed for much smaller numbers.

The intent of the Master Plan is to take a comprehensive look at the Corps' role in providing outdoor recreation opportunities at the Canal; give guidelines for recreation facility development to meet expected visitation; restore the scenic attractiveness of areas now suffering from deterioration; provide a basis for an enlarged visitor information and interpretation program; and identify those environmental elements for preservation which combine to make the scenic qualities of the Canal and adjacent lands.

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Appendix A

I. INTRODUCTION

1. General

Purchase of the Cape Cod Canal by the United States of America in 1928, and subsequent development, was achieved under the River and Harbor Acts of 21 January 1927, supplemented by the Public Works Acts of 1933 and 1935, and the River and Harbor Acts of 1936, 1945 and 1958.

2. Project Purposes

The Cape Cod Canal was originally constructed by private interests as an aid to navigation. It became an uneconomical investment and subsequently was purchased by the Federal Government for \$11,500,000 in 1928. Considerable improvements were made in the interest of safety and to make the Canal a more practicable waterway.

The Canal saves from 65 to 150 miles in the navigation distances depending upon the particular route that might otherwise have been used. Canal traffic has increased dramatically as has the annual tonnage since the Federal Government opened the enlarged waterway to toll free use. Benefits to shipping run into the millions of dollars each year, but even more important is the benefit due to avoidance of the hazardous route around Cape Cod where hundreds of ships have been wrecked.

3. Purpose of Master Plan

The purpose of this Master Plan is to present a comprehensive and coordinated program for the development, management and use of

the lands owned in fee by the United States Government in the Cape Cod Canal project area for public purposes which are compatible with the authorized purpose. This plan will serve as a guide in the operation and control of land and water use, exclusive of primary navigation purposes, for the derivation of maximum public benefits from the resources of the project. It is intended that this plan will be flexible so that adjustments may be made to it as changing conditions warrant.

4. Cooperative Planning

This Master Plan has been coordinated with several Federal, State and local interests in an effort to provide optimum recreation opportunities, as well as fish and wildlife management, throughout the Canal area. Non-Federal management and operation of certain areas for recreation development and fish and wildlife enhancement has been accomplished in several instances. Plans for conservation and development have been coordinated with other recreation developments in the Cape Cod Canal area in order to assure compatibility of all interests and to provide for maximum public benefits and optimum utilization of all resources.

5. Scope of Report

The scope of the Master Plan includes an evaluation of the public recreational potential of the Cape Cod Canal area in relation to other recreational opportunities available in the surrounding geographical areas.

Future development of public use facilities will be planned and constructed in accordance with the provisions of this Master Plan. Implementation of the planned recreational development will take place as soon as funds are made available according to the planned schedule of development.

Special emphasis will be placed on planning for optimum development of any given area, not necessarily the maximum development possible. All recreation activities will be considered in relation to each other and in relation to their contribution to the total recreational environment of the Canal area.

II. PROJECT DESCRIPTION

1. Location

The Cape Cod Canal is located at a narrow neck of land joining Cape Cod to the mainland of Massachusetts. It connects Buzzards Bay to the west with Cape Cod Bay to the east and lies within the towns of Bourne and Sandwich in Barnstable County. Highway access to the Canal and Cape Cod is provided by U.S. Routes 3 and 6 and Massachusetts Route 28.

2. Project Data

a. Climate

The Cape Cod climate offers very comfortable late spring, summer, and fall temperature levels. Winters are cold with occasional sub-zero readings. The average January temperature at the East Wareham weather station is about 29°F while the average July temperature is about 71°F. Extreme temperatures have been recorded at

-24°F and 99°F. The length of the average frost free period is about 270 days. Precipitation is well distributed throughout the year and averages about 47 inches. Water temperatures in Buzzards Bay and Cape Cod Bay range from a low of about 30°F in the winter to a high of about 73°F in the summer. However, Buzzards Bay is generally warmer than Cape Cod Bay, particularly during the summer months.

b. The Canal

The total length of the Cape Cod Canal, including approaches and a 7.7 mile land cut, is 17.4 miles. It extends generally in a south-westerly course from the northerly stone breakwater in Cape Cod Bay at Sandwich, through dredged channels to a point in Buzzard's Bay near Cleveland Ledge Light. The depth is 32 feet and the channel width is 540 feet through the land cut and 500 feet in the Hog Island Channel.

Service roads extend along both banks from the east entrance to the vertical lift railroad bridge. Related facilities include a protective breakwater and a jetty at the eastern entrance, dikes along the Buzzards Bay approach channel and five anchorages including the East and West Mooring Basins, East and West Boat Basins and the harbor refuge in Onset Bay.

The mean tidal range in Cape Cod Bay is 9.4 feet, and in Buzzards Bay it is 4 feet. Strong tidal currents in the Canal change every six hours and reach an average maximum velocity of 4 knots. High tide in Buzzards Bay precedes high tide in Cape Cod Bay by approximately three hours.

c. Structures and Other Features

The railroad bridge has a vertical single track lift span 544 feet long, a vertical clearance of 7 feet above mean high water when closed and a vertical clearance of 135 feet above mean high water when open. The lift span can be raised or lowered in approximately 2 1/2 minutes. The horizontal channel clearance is 500 feet.

The Sagamore and Bourne Highway Bridges have a vertical clearance of 135 feet above mean high water and horizontal channel clearance of 500 feet at mean high water. Both bridges are four lanes, undivided, and are maintained by the Corps of Engineers.

The 7 acre East Boat Basin is located about 3,000 feet inside the Cape Cod Bay entrance at Sandwich. The original 2.7 acre basin, 13 feet deep, was increased by 4.3 acres at an 8 foot depth in 1963.

The East Mooring Basin lies on the north side of the Canal opposite the East Boat Basin. It is 350 feet wide, 2,500 feet long, and has an authorized depth of 25 feet at mean low water.

The West Mooring Basin is on the southeast side of Hog Island Channel in Buzzards Bay. It is 350 feet wide, 3,300 feet long and has an authorized depth of 32 feet at mean low water. Both mooring basins are used by ships waiting out storms or in difficulty waiting to be towed.

The Corps of Engineers operates an administration area on the north side of the Canal in Buzzards Bay near the Railroad Bridge, and Canal traffic control facilities at various locations. Facilities include telephone, television, radio, closed circuit and

radar communication systems, a small craft wharf, a boat basin for Canal service craft, shops, garages and marine railway. These facilities are supervised by the Engineer-in-Charge under the Chief, Operations Division, who in turn is responsible to the Division Engineer, New England Division, Corps of Engineers.

3. Visitation

The value of the Cape Cod Canal as a public recreational resource is evidenced by the heavy use, which has averaged well over a million annual visitors in the last ten years. The Canal shores have a scenic value which should be preserved. The engineering accomplishments, including the Canal, the long breakwaters and the bridges attract the sightseer and the recreation seeker. The frequent passage of commercial ships (approximately one per hour) also increases visitor interest. The Canal area provides land suitable for picnicking and camping, protected shoreline for anglers, saltwater beaches, and excellent opportunities for recreational boating.

The graphs included as Exhibit A show visitation at the principal recreation areas on Federal and leased lands at the Cape Cod Canal for the period 1966-1973, and the distribution of visitation by activities.

The estimated distribution of visitation by activities shown on these graphs is based on user surveys taken by the Corps of Engineers. Although the public participates in more than one activity, the distribution of use was made from total estimated annual activities

adjusted to 100 percent annual visitation and is a good indicator of activity participation.

Since all visitors to Cape Cod must pass over the Canal, considerable pressure is exerted on the various recreational facilities along the Canal. In addition, there are two state reservations on the Cape: Nickerson State Park in Brewster and Shawme-Crowell State Forest in Sandwich. The former ranks as one of the most popular camping areas in the northeastern United States, principally on account of its fresh water ponds and proximity to the salt water beaches of the mid-Cape area. Shawme-Crowell State Forest was opened to camping for the first time in 1962. In spite of the development of more camping facilities over the past few years, neither park has been able to meet the public demands during the summer months. The graphs included as Exhibit B depict the record of overnight visits at these areas. This information has been supplied by the Massachusetts Department of Natural Resources.

The Cape Cod National Seashore is a unit of the National Park Service and was first opened to the public in 1962. The Massachusetts State Plan, "Cape Cod 1980", predicted that visitation to the National Seashore would reach one million by 1970. Records of visitation provided by the National Park Service indicate that this estimate was far below what actually happened. This again is another indicator of recreational pressure on Cape Cod, some of which is reflected on the Cape Cod Canal areas. Information on visitation

provided by the National Park Service, Cape Cod National Seashore, which includes visitation at the privately operated camping areas within National Seashore boundaries, is included as Exhibit C.

The National Park Service estimates that use of unprotected beaches within the National Seashore is as great or greater than the use of the protected beaches. In addition to those operated by the National Park Service, there are a number of town administered public beaches within the Seashore. However, most of these cannot be expanded, even though they receive very heavy use.

All indicators of recreation tourism, both in the private and public sector, point toward a continued upward trend in visitation to the Cape Cod area. Activities participated in and facilities and accommodations desired are many and varied.

Nickerson State Park and Shawme-Crowell State Forest will help meet the needs of the thriving tourist industry of the Cape. The use of the Cape Cod National Seashore has far exceeded predictions and will be a focal point to future generations of tourists.

The Corps of Engineers initiated active development of the Cape Cod Canal recreational resources in 1963. This included a program to provide access, parking, sanitary and fishing facilities. In the following year, additional facilities were provided in Bourne Scenic Park and boating facilities were completed in the East Boat Basin. Since this time, public visitation has increased dramatically.

Use of all Canal facilities can be expected to increase at a closely parallel rate to tourism on the Cape. Sometime in the not

too distant future prior to 1980, it can be assumed that use of the Canal will reach the maximum capacity of its resources. Regulations to eliminate overuse and despoilment will be necessary. The development plan, carried later in this Master Plan, is designed to give a balanced development of the Canal land areas, to protect its beauty, to eliminate overcrowding and to deny despoilment.

The history of outdoor recreation in recent years has shown conclusively that often public demand outstrips the supply of suitable facilities. This is particularly true in the cases of camping, boating, and sightseeing. With this in mind, the Master Plan for the Cape Cod Canal provides for an orderly expansion of the valuable recreational resources in the Canal area, so they may better serve the public.

III. OPERATING PROJECTS-STATUS

1. Project Development and Operation

Construction of the original Cape Cod Canal was attempted by the Cape Cod Canal Company in 1880. The cost of dredging and excavation proved so great that the project was subsequently abandoned.

In 1899 the Commonwealth of Massachusetts granted a charter for construction of a canal to the Boston, Cape Cod and New York Canal Company, headed by August Belmont, a New York financier. The cost of construction was estimated at \$12,000,000 and the charter specified a minimum depth of 25 feet at MLW and minimum bottom width of 100 feet. Work commenced in 1909 and the State accepted the

project as completed in accordance with the charter, in 1918. The total cost of \$16,131,000 included canal construction, acquisition of land, two highway bridges and one railroad lift bridge, a 3,000 foot breakwater and a 1,000 foot sand catcher at the Cape Cod Bay entrance.

The strong tides and limited channel width within the completed Canal resulted in shipping accidents and toll collection receipts did not meet the expected amount.

The Federal Government purchased the Canal in 1928 for \$11,500,000 and opened it as a toll free waterway. It was widened to 170 feet a few years later. Between 1932 and 1935 two new high level highway bridges and a new vertical lift railroad bridge were built. By 1940 the Canal had been widened to a maximum width of 540 feet with a minimum depth of 32 feet at mean low water, its present size.

Vessels pass through the Canal twenty-four hours a day every day of the week. Marine traffic through the Canal is regulated by Marine Traffic Controllers from a modern control center with the aid of modern electronic facilities such as radar, closed circuit television and multi-channel radios. The raising and lowering of the railroad bridge is coordinated with Canal traffic which has precedence. Army Engineer patrol boats are on constant duty in the Canal and approach channels obtaining traffic data from commercial vessels, assisting boats in distress, enforcing speed regulations, fishing laws and the removal of floating debris. In addition, the Corps has on hand at headquarters two tug boats to perform hydrographic

surveys and assist vessels in emergency situations.

The Cape Cod Canal is open toll free to adequately powered vessels properly equipped and seaworthy. Since its purchase by the Federal Government in 1928, the average annual shipping tonnage has increased from 1.5 million to over 13 million tons.

Tonnage figures indicate a decrease in the period from 1960-1964 and a gradual rising trend to 1973. This can be explained in the drop in shipments in coal and gypsum in the early period and the recent increase in oil, particularly in the oil shipment to the Canal Electric Company located on the Canal. Looking forward, as the container ship problem in Boston is resolved and if the LASH (Lighter Aboard Ship) concept catches on there, big increases could be expected in the future in Canal traffic and commerce.

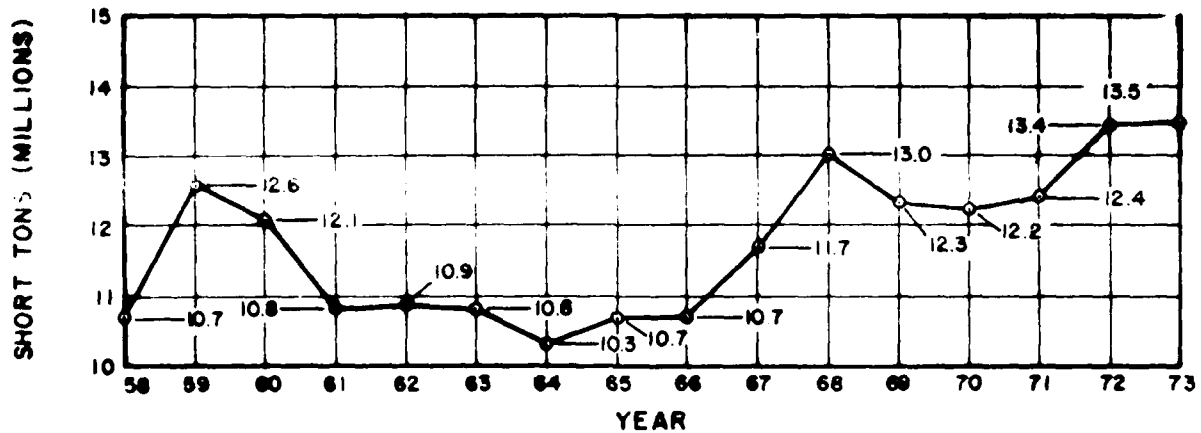
From 1961 to 1967 about 2/3 of the total vessel traffic was classified as pleasure craft while from 1968 to 1973 this increased to about 3/4 of the total traffic. About 1/2 of the total tonnage has been classified as petroleum products. The dramatic increase in pleasure vessel traffic in 1968 and continuing through 1973 is due to the increased number of boats and facilities in the Cape Cod area. The graphs on the following pages indicate the tonnage and vessel traffic through the Cape Cod Canal from 1958 to 1973.

2. Expenditures for Public Use Development

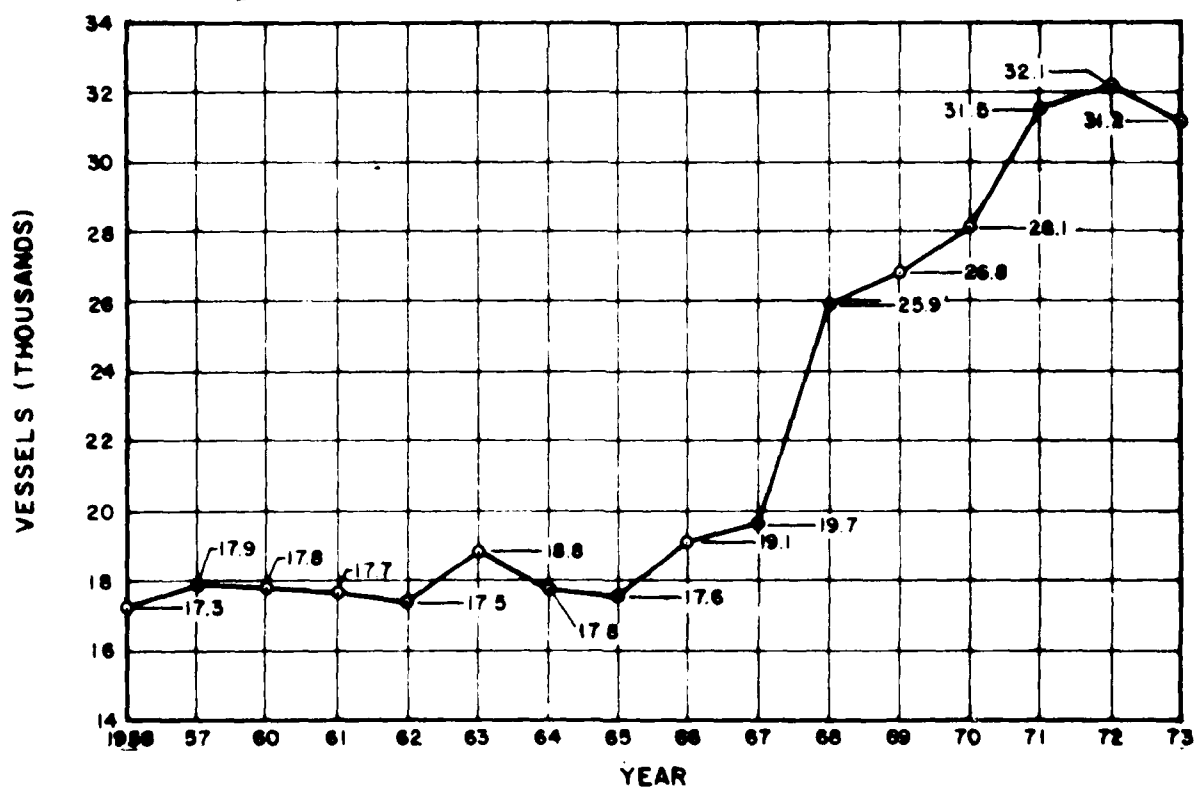
a. Federal Government

Total Federal expenditures through FY 1974 for public use and environmental resource development at the several recreation

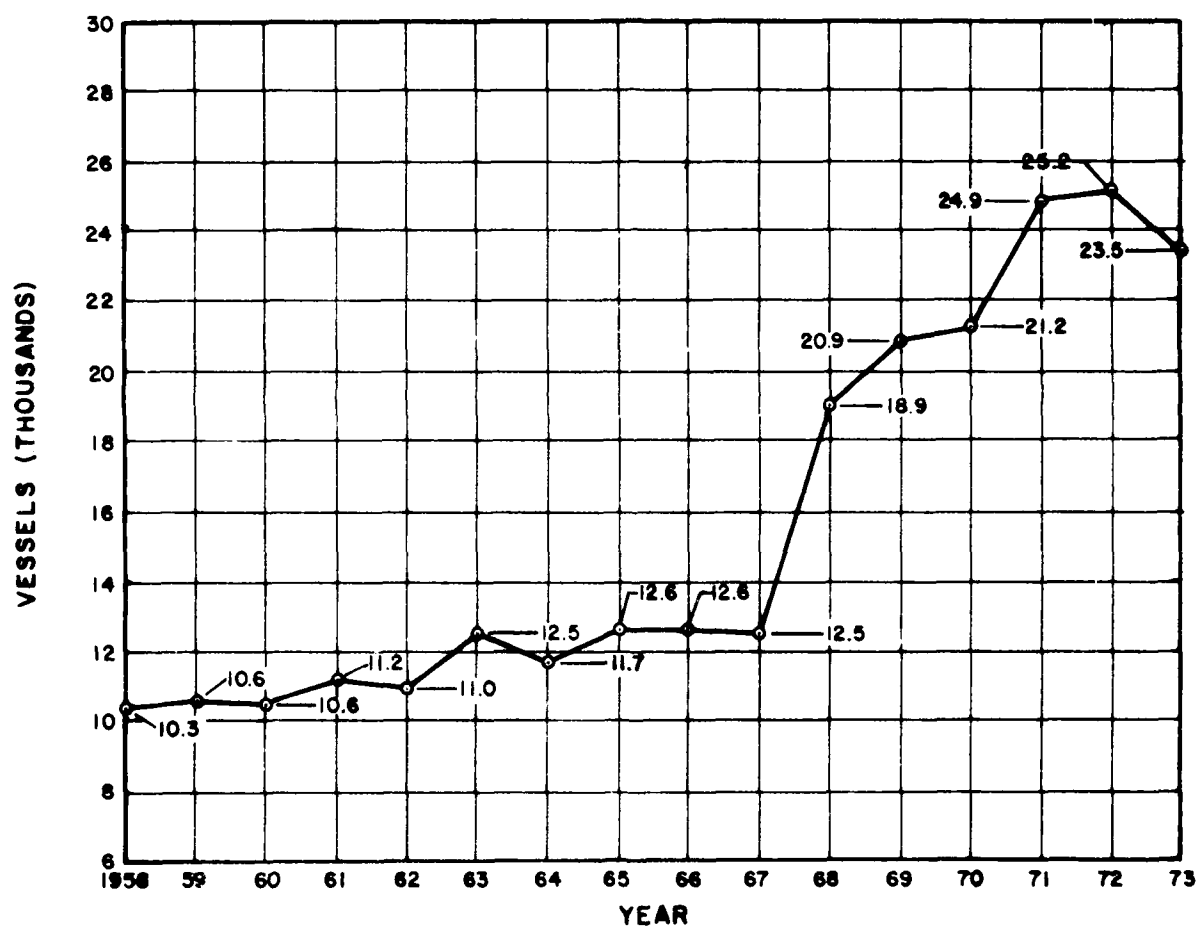
COMMERCIAL TONNAGE THROUGH THE CAPE COD CANAL



TOTAL VESSEL TRAFFIC THROUGH THE CAPE COD CANAL



PLEASURE VESSEL TRAFFIC THROUGH THE CAPE COD CANAL



areas along the Cape Cod Canal have amounted to \$1,110,000. Of this, \$613,000 has been Code 710 funds and \$497,000 has been O & M funds.

b. Non-Federal Public

Total non-Federal expenditures through CY 1974 for development at Scusset Beach State Park operated by the Commonwealth of Massachusetts, at the Bourne Recreation Area and at Bourne Scenic Park operated by the Bourne Recreation Authority, and at the East Boat Basin which is partially leased to the Town of Sandwich, are not available from the respective non-Federal interests.

c. Private Investment

There is presently no private recreational development on Federal land at the Cape Cod Canal and none is contemplated in the future.

IV. RECREATIONAL AND ENVIRONMENTAL RESOURCES

1. Environmental Quality

The terrain in the immediate area surrounding the Cape Cod Canal is hilly and rolling with the highest elevation 177 feet above mean sea level. Much of the area is wooded with pitch pine, oak and locust being the predominant trees. Other common types of vegetation are american beachgrass, beachplum, rugosa rose and shore juniper.

Several scenic vistas afford a fine view of the Canal from U.S. Route 6 and most of the principal recreation areas along the Canal are served by this highway. Some of the less desirable visual aspects of the area include the fish processing plants and

the Canal Electric Company power plant located near the East Boat Basin, the railroad tracks which run along the south bank of the Canal and the utility lines and poles adjacent to the service roads which parallel the entire length of the Canal.

A total of 982 acres of land situated on both sides of the land cut are presently owned by the United States and administered by the Corps of Engineers. The water area in the Canal proper amounts to about 575 acres at mean low water. In addition, about 98 acres in fee ownership are included in the Stony Point Dike, both located at the westerly entrance to the Canal. The gross acreage under the jurisdiction of the Corps of Engineers is therefore 1716 acres. More than 50 outgrants have been made in the form of leases, licenses, permits and easements. The following major areas have been leased for recreational purposes.

(a) 380 acres at Scusset Beach State Park to the Commonwealth of Massachusetts.

(b) 70 acres at Bourne Scenic Park and 33 acres at the Bourne Recreation Area to the Bourne Recreation Authority.

(c) 4.3 acres at the East Boat Basin to the Town of Sandwich.

A number of small areas are used for scenic overlooks on Route 6 both on the north and south side of the Canal and are maintained by the Massachusetts Department of Public Works.

During the deepening and widening of the Canal in 1937 to its present dimensions, the creation of a land fill between the mainland, Hog Island and Mashnee Island was determined to be necessary to improve the hydraulic characteristics of the waterway. Permission to tie in the ends of privately owned properties of Rocky Point and Mashnee Island was sought and ultimately received from owners on the strength of assurance that recreation would not be permitted. The owners of Mashnee Island, their heirs, executors, successors and assigns were granted the right to construct and maintain a roadway for access over the dike. Legal documents attesting to the proceeding make no provision for revocation or amendment except in aid of navigation. In view of the above condition, any departure from the original plan without consent of those parties directly involved could be an abrogation of assurances and therefore no expanded use of Rocky Point Dike is proposed at this time. The man made fill section provides an excellent sandy beach and shell fishery, which because of the above mentioned provision, are not accessible to public usage. Stony Point Dike, consisting of 98 acres on the other side of the Canal, has no public access. However, it receives considerable use from boaters, fishermen, picnickers and other people seeking leisurely recreation. Stony Point Dike is a good island type resource with no formal facilities of any kind.

2. Recreational Use

Existing recreational use of the Canal area consists primarily of sightseeing, fishing, camping, picnicking and swimming. This use is expected to increase in the future and present facilities will be expanded to help meet the growing demand.

A significant activity which has rapidly increased in recent years is the passage of recreational boats through the Canal. The Canal serves recreational as well as commercial traffic and provides a safe passage for the smaller pleasure vessels who can pass freely to the north or south and avoid the navigational hazards and changing weather of an outside passage around Cape Cod. For the last several years about 25,000 pleasure vessels annually have availed themselves of this safety factor, as well as a substantial saving in time, in passing between Cape Cod Bay and Buzzards Bay.

The "home port" for commercial and pleasure vessels within the land cut of the Canal is found at the East Boat Basin in Sandwich, a Corps facility which was enlarged to its present size in 1963. Since then it has been filled to capacity during the boating season.

V. FACTORS INFLUENCING RESOURCE DEVELOPMENT

1. General

All lands at the project were acquired solely for navigational purposes. No lands were acquired for recreational use and prior

to authorization for use of project lands for public recreation, disposal was made of several parcels of fee land amounting to approximately 250 acres. Because of the limited amount of public ownership now available, no additional area will be declared excess or disposed of.

In general, all land at the Canal will be allocated to priority one, general public use except designated areas for project operation and maintenance. Until they become incompatible with the recreational use of the project, existing licenses, leases and permits for commercial purposes will continue. As renewal of such use is not Requested, the land area will be converted to priority one.

2. Demographic

In addition to the visitation generated by the attractive recreation resources of the Canal area, the increasing popularity of Cape Cod as a summer resort is the factor which, above all others, brings visitors into contact with the Canal. The hundreds of miles of sandy beaches, the fresh water ponds and the Cape Cod flavor and atmosphere exert an attraction for visitors which is not only local and regional, but international in scope. The Cape Cod National Seashore, established in 1961, is already the most productive generator of visitation, much of which is year-round. It is estimated that on a peak summer day

nearly 90,000 persons cross the two highway bridges over the Canal to visit Cape Cod.

Three other factors contribute to the recreational pressure on Cape Cod: Population increases, greater accessibility to metropolitan areas and increased leisure time. It was estimated that for 1970 in addition to the permanent Cape Cod population of 97,000 there were 358,000 summer residents. This is expected to increase to nearly 500,000 by 1980. The permanent population has risen by 38 percent since 1960. As long ago as 1955, the National Park Service stated in its preliminary report on the proposed seashore, that Cape Cod lay within a one day's drive of 50 million people. The completion of Interstate and other high speed limited access highways in the intervening years have expanded the area of accessibility by the reductions in travel time. Within 50 miles of the Canal are over three million people living in ten counties of Rhode Island and Massachusetts.

3. Topography and Geology

The land surrounding the Cape Cod Canal is gently rolling with soil consisting mostly of sand. It is therefore well suited for development of various kinds including recreation facilities, even though erosion is sometimes a problem and topsoil is not plentiful.

4. Accessibility

Several major highways provide excellent access to Cape Cod and the Canal area. U.S. Route 6 from New Bedford and points west runs parallel to the north bank of the Canal and crosses the

Sagamore Bridge where it becomes the mid-Cape highway to Provincetown. It is mostly a 4 lane divided highway. Massachusetts Route 3 from Boston is also a 4 lane divided highway and ends at the Sagamore Bridge where it joins U.S. Route 6. Massachusetts Route 28 crosses the Canal over the Bourne Bridge and is a 4 lane divided highway to Falmouth. North of the Canal Route 28 intersects Massachusetts Route 25 which is a 4 lane divided highway that runs parallel to Route 28 toward Brockton and Boston. Future plans call for the completion of Route 25 from its present terminus with Route 28 in East Wareham via the Bourne Bridge to the Mid-Cape highway (Route 6) on the southerly side of the Canal. There are traffic circles at the Bourne Bridge where Routes 28 and 6 intersect and at the Sagamore Bridge where Routes 3 and 6 join. Access along the south bank of the Canal is provided by a 2 lane major highway (also designated as U.S. Route 6) between the Bourne and Sagamore Bridges.

Traffic passing over the Cape Cod Canal is somewhat restricted since the Bourne and Sagamore Bridges are the only roads over the Canal to Cape Cod. This fact, in addition to the intersecting highways and the traffic circles at each bridge, results in traffic jams at times of peak use during the summer. Possible solutions being considered include a third bridge over the Canal with appropriate highway relocations, expansion and interchanges. If these plans ever materialize it should alleviate some of the congestion at the Canal.

5. Area of Influence

The 1970 census shows a population of over 3,000,000 people living within 50 miles, or approximately a one hour's drive, of the Cape Cod Canal. These people reside in five counties of Massachusetts with a total population of about 2,215,000 and in the State of Rhode Island with a population of about 947,000. Surveys indicate that 90% of the visitors to the Canal come from outside the 25 mile zone and that 45% come from the 50 to 100 mile zone. The population is steadily increasing throughout the area of influence while at the same time people have more leisure time to spend enjoying the outdoors.

Most of the recreation development at the Canal is directed toward day-use facilities. Additional camping has been the most in demand and in addition to the camping area at Bourne Scenic Park, the Commonwealth of Massachusetts has developed camping facilities at Scusset Beach which will complement their existing day-use development. Improved access for fishermen, bicyclists, hikers and sightseers is also needed and is being planned.

6. Related Recreational, Historical and Scientific Areas

There are two State operated recreation areas on Cape Cod, Nickerson State Park, 30 miles from the Canal in Brewster and Shawme-Crowell State Forest, adjacent to the Canal in Sandwich. The latter area is void of water based activities and its users rely heavily on the Canal area for fishing and swimming. Both areas are developed primarily for camping and are receiving

maximum utilization. Nickerson has averaged over 200,000 visitors per year since 1965 with many camping parties turned away on Saturdays and Sundays. Visitation at the smaller Shawme-Crowell area has averaged over 100,000 since 1967, despite a severe forest fire which destroyed many camp sites in 1965. Redevelopment in 1966 doubled the capacity of the area, however, and has resulted in immediate saturated utilization ever since. This is a sound indication of the latent demand for camping on Cape Cod. Both State areas are intensively developed and have little opportunity for expansion.

Myles Standish State Forest in Plymouth is less than 10 miles from the Canal and offers a wide range of outdoor recreation opportunities including camping. Visitation averages over 200,000 annually. Also in nearby Plymouth is historic Plymouth Rock, Plimoth Plantation, Pilgrim Village and the Mayflower II, all of which are popular recreation and historical attractions.

The Cape Cod National Seashore is a relatively new resource that has experienced heavy use. Established in 1961 and first opened in 1962, it will eventually embrace 27,000 acres through various forms of fee and easement acquisition. The focal point for the first time visitor is found at the Cape Cod National Seashore Visitor Center where displays illustrate the many recreational activities on Cape Cod and explain some of the history of the Cape. Visitation, as previously discussed, includes a mix of activities such as salt water swimming, camping at private campgrounds, guided tours, nature walks,

hiking over the sand dunes, and use of private motels within the seashore boundaries.

Located in Falmouth about 16 miles south of the Cape Cod Canal is the Woods Hole Oceanographic Institute, Marine Biological Laboratory and National Marine Fisheries Service Laboratory. All are world famous for their scientific research, study and investigation of the ocean environment.

The Massachusetts Maritime Academy is another significant institution which should be noted in that it is located adjacent to the Canal in Buzzards Bay. It's primary objective is to prepare young men for licensed service in the United States Merchant Marine with degrees offered in Marine Engineering and in Marine Transportation.

7. Anticipated Attendance

All indicators of recreation tourism, both in the private and public sector, point toward a continued upward trend in visitation to the Cape Cod area. Activities participated in and facilities and accommodations desired are many and varied.

While all activities in general have shown an upward trend certain activities are dominant and can be accommodated with added development. Sightseers have increased and can be accommodated by improved parking and more adequate sanitary, rest and interpretive facilities.

To cope with the heavy fishing use of the Canal, improved access, parking and sanitary facilities, as well as more fish piers can be provided.

Camping is probably one of the greatest needs of the Cape as witnessed by immediate saturation of new developments. The Canal area has opportunities to help meet these needs. Increased camping facilities will offer accommodations for people seeking other activities such as fishing, swimming and sightseeing.

Though salt water swimming is a popular activity and there is an increasing need, the opportunities for increased use of Canal resources to meet these needs is limited. Scusset Beach is the only major publicly owned salt water beach near the Canal. It cannot be physically expanded but can receive higher density use.

Pleasure boat berths at the East Boat Basin can accommodate no more boats. There is a growing need in the general vicinity of the Canal and Cape Cod for additional pleasure boat accommodations. All levels of government and private enterprise have continuing studies of potential areas of improvement to meet this demand. The Cape Cod Canal has no opportunities for major additional berthing unless land cut developments are considered.

In general, needs for all activities will increase at the Canal yet development must be consistent with and limited to the carrying capacities of the resource.

8. Cost Sharing Requirements

There are two recreation areas at the Cape Cod Canal where development of public use facilities has been cost shared with

non-Federal interests. Bourne Scenic Park is a camping area with picnic and swimming facilities operated and managed by the Bourne Recreation Authority. Recreation development prior to FY 75 was provided by both the Corps, the Town of Bourne and the Bourne Recreation Authority. There was no formal cost sharing agreement. All development beginning with FY 75 funding will be done under a formal cost sharing agreement as presented by this Master Plan.

Scusset Beach State Park is developed as a public bathing and camping area, but also has a fishing pier and receives use from fishermen, hunters and sightseers. All existing development has been provided by the Commonwealth of Massachusetts, except for the camping facilities which were cost shared on a 50-50 basis with the Bureau of Outdoor Recreation.

VI. COORDINATION WITH OTHER AGENCIES

1. Federal Agencies

Several Federal agencies have participated in coordinated studies leading to planning recommendations discussed in this Master Plan. Two important reports from the Bureau of Sport Fisheries and Wildlife and the Bureau of Outdoor Recreation are included in Appendix F - Reports and Comments of Other Agencies.

The Bureau of Sport Fisheries and Wildlife reported on the ways and means for developing and increasing the utilization of the

fish and wildlife resources of the Cape Cod Canal and adjacent Corps properties. The report was prepared in cooperation with the Massachusetts Division of Fisheries and Game, the Massachusetts Division of Marine Fisheries and the Bureau of Commercial Fisheries.

The Bureau of Outdoor Recreation reported on the recreation resources of the Cape Cod Canal and suggested improvements for public recreational use of the lands under Corps jurisdiction. A draft of this report was coordinated with the U.S. Fish and Wildlife Service, National Park Service, and the Divisions of Fisheries and Game, Marine Fisheries and Forests and Parks of the Department of Natural Resources.

Coordination has also taken place with the National Park Service, particularly concerning the relationship between the Cape Cod National Seashore and the Cape Cod Canal area.

2. State Agencies

Scusset Beach State Park at the eastern end of the Canal is leased to the Commonwealth of Massachusetts. All present development at this area has been by the State and future development is being planned by the State with approval from the Corps of Engineers. The existing recreation facilities were constructed by the Department of Public Works, however, all future development will be carried out by the Department of Natural Resources, Division

of Forests and Parks with matching funds provided by the Bureau of Outdoor Recreation under the Land and Water Conservation Fund. The Division of Fisheries and Game is also consulted on matters of mutual interest, especially concerning pheasant stocking programs at Scusset Beach and fishing activity along the Canal.

The East Boat Basin, located near the Cape Cod Bay end of the Canal across from Scusset Beach State Park, was also developed as a cooperative venture with the Commonwealth of Massachusetts. The Departments of Commerce, Public Works and Natural Resources participated in coordinating this project with the Corps in an effort to best serve the public.

3. Local Agencies

Several local interests have participated in the recreational planning of various public use areas along the Canal. Leases for recreational use have been issued to the Bourne Recreation Authority, Town of Sandwich and the Sagamore Rifle Club. Development at Bourne Scenic Park has been coordinated with the Town and the Recreation Authority, while the East Boat Basin is managed by the Town of Sandwich. The Bourne Conservation Commission and the Massachusetts Maritime Academy have also contributed to the development of this Master Plan and the recommendations presented, leading to a

coordinated approach to providing the outdoor recreation opportunities available at the Cape Cod Canal.

VII. PLAN OF DEVELOPMENT

1. Recreation Areas

Virtually all project lands at the Canal are available for public recreational use and are not zoned or classified for any particular purpose. Certain areas have been developed primarily for restricted types of activities, such as camping, while other areas remain undeveloped.

Public use development areas were selected after map studies and field reconnaissance, taking into consideration the terrain, accessibility by existing and proposed roads, proximity to water areas, scenic qualities, other public use areas, past use trends, and other pertinent data. The general locations of public use areas are shown on Plate No. 1 - Cape Cod Canal General Plan.

The areas to be developed were selected after consultation with representatives of the Bureau of Outdoor Recreation, U.S. Fish and Wildlife Service, and State and local governmental agencies. These bodies expressed their opinions as to the development that should be provided. Reports and views of other agencies were taken into consideration in the planning of recreation facility developments.

The major portion of the present use is centered on sightseeing, camping, swimming, fishing, picnicking, walking, and similar activities, which generally do not require extensive land areas. The important factor is that the present volume of visits and type of use can be better served by increasing the availability of certain resources

and planning for the future demands. The plan of development presented in the following paragraphs is prepared with this in mind.

a. Scusset Beach State Park. 380 acres - Leased to the Commonwealth of Massachusetts.

Existing Facilities: Administration building, bath house, concession stand, drinking water (two sources), 15 fireplaces, 60 picnic tables, one 200 foot fishing pier, parking for about 500 cars, natural beach 2,200 feet long and 400 feet wide, access roads, 100 camp sites and sanitary facilities.

Scusset Beach State Park was developed by the Department of Public Works, Commonwealth of Massachusetts. The beach area is natural and has no room for expansion. However, it is adequate to support existing and projected future use. Three interpretive panels would be located at Scusset Beach.

Scusset Beach State Park has the capability of supporting an expanded trailer camping facility. Suitable facilities for this type activity are significantly inadequate on Cape Cod and particularly in the vicinity of the Canal. Until 1966 informal use by camp trailers of Canal parking areas at major access points was allowed. This use grew to a point where it became unmanageable. Therefore, in 1967 this use was stopped and all campers were asked to leave after dark due to inadequate sanitary facilities. This resulted in protests



SCUSSET BEACH CAMPING AREA



SCUSSET BEACH

from individual campers and outdoor sports writers alike. The heavy protest made it quite evident that adequate camping facilities were lacking and in great demand.

In cooperation with the Massachusetts Department of Natural Resources a plan was prepared for development of approximately 400 trailer campsites at Scusset Beach State Park. It was considered desirable to use a cluster approach with adequate open space between clusters. Toilet facilities were planned to be centrally located within the individual clusters.

The development was planned to be constructed in phases. Under a bond issue the Massachusetts Department of Natural Resources started construction of the first phase of development in 1973 with the Bureau of Outdoor Recreation participating in the cost sharing on a 50-50 Federal-non-Federal basis. One hundred trailer camp sites with utilities were made available for public use for the 1974 summer season.

Vegetation cover along the fringe of the Canal and at Scusset Beach is sparse. One to two hundred feet inland from these areas the cover increases to that of a dense-intertangled low scrub pine, typical of Cape Cod. To insure that a high quality trailer camping facility was developed, adequate steps for preservation of existing cover and establishment of new cover were undertaken.

A schematic presentation of the plan of development is shown on Plate No. 2 - Scusset Beach State Park.

b. Sagamore East. 8 acres.

Existing Facilities: Comfort station, 2 picnic tables, parking for 30 cars. Facilities developed by the Corps of Engineers.

This area consists of a narrow strip of land lying along the north side of the Canal just east of the Sagamore Bridge. There is an existing comfort station here and six additional picnic tables are proposed for this area along with an interpretive panel and some decorative fencing.

A narrow strip of Government-owned land stretches easterly from the comfort station between a public road and the Canal. This strip is presently used for picnicking. Since the road is not curbed, auto traffic has entered the area indiscriminately and has destroyed the grass cover and other vegetation. To correct this situation, it is proposed to install a curb and provide suitable access points.

c. The Herring Run. 4 acres.

Existing Facilities: Comfort station, parking for 80 cars, 9 park benches, 8 picnic tables, 5 stairways. Facilities developed by the Commonwealth of Massachusetts and the Corps of Engineers.

Located about a mile west of the Sagamore Bridge on the north side of the Canal, this area is one of the most popular on Cape Cod. It has averaged over 325,000 visitors annually for the past eight years. The area provides a spectacular view of vessels passing through the Canal and is utilized for sightseeing, picnicking, fishing and as a base for walking and bicycling the Canal maintenance road

The migration of herring up the Herring River fish ladders is a prime attraction which brings many visitors each spring.

Several improvements in addition to a considerable amount of beautification and landscaping are proposed here. Highway and information signs should be better coordinated, a visitor information center, and interpretive panels constructed, and the utility lines near the service roads put underground. Highway access plans in connection with the proposed visitor information center will be reviewed with the Massachusetts Department of Public Works.

Future development plans are shown on Plate No. 3 - The Herring Run.

d. Bournedale Hills. 2 areas of 2 acres each.

Existing Facilities (each area): 2 picnic tables, 2 park benches, parking for 45 cars. Facilities developed by the Commonwealth of Massachusetts and the Corps of Engineers.

These two areas, located on the north side of the Canal between the Bourne and Sagamore Bridges, provide the highest viewing points of the Canal from U.S. Route 6. Both provide adequate parking and have limited expansion capabilities. The following items of improvement are proposed:

- (1) More adequate and attractive fencing and paved walkways.
- (2) Additional picnic tables.
- (3) Planting of shade trees.
- (4) Additional openings in the guardrail fencing at the edge

of the parking areas to improve access.

These two areas are shown on Plate No. 4 - Bourne Development Areas.

e. Bourne Scenic Park. 78 acres - 70 acres leased to the Town of Bourne, 8 acres Town owned.

Existing Facilities: Administration building, bath house and comfort station combination, saltwater tidal swimming pool (400 x 100 ft.), playground equipment, 3 comfort stations, 342 campsites, 5 stairways, 400 picnic tables, 20 drinking water bubblers, parking for 200 cars, access roads. All facilities developed by the Town of Bourne and the Corps of Engineers.

Located at the foot of the Bourne Bridge on the Canal's north bank, and extending more than one-half mile eastward from the bridge, this picturesque park is one of the most popular in the area, particularly for family activities. It is presently operated and maintained by the Bourne Recreation Authority, previously by the Town of Bourne, and most of the existing recreational improvements until recently, have been financed by the Authority and the Town. Expansion and modification will be accomplished on a 50-50 cost sharing basis with the Corps of Engineers.

The existing camping area at this park is now over used. Inadequate sanitary facilities and vehicle traffic on camping service roads point to this condition. Expansion of facilities and sites, and control of visitation will improve environmental features. Construction of a new trailer camping development has recently been completed and modifications are proposed for the old area.



BOURNEDALE HILLS



PICNICKING AT THE HERRING RUN



TIDAL SWIMMING POOL AT BOURNE SCENIC PARK



BOURNE SCENIC PARK CAMPING AREA

A new bath house - comfort station and sewage treatment system has also recently been constructed. The camping area has received maximum use during the past several seasons. The comfort stations were constructed for fewer campers than presently utilize the park and it is proposed to replace two of the existing comfort stations with new facilities meeting present criteria for intensively developed campsites. This will include adequate toilet and wash facilities inclosed in structures of Cape Cod architecture. Sewage treatment will consist of septic tank systems with adequate leaching fields. At present, treatment is by cesspools, which require frequent pumping of effluent.

The salt water tidal swimming pool requires constant maintenance due to inadequate surface drainage. To cope with this problem, the outer periphery of the pool area has been slightly bermed to allow surface drainage to flow away from rather than into the pool area. Along with this modification will be landscaping and planting to improve the aesthetics of the swimming area and to assist in stabilizing soil conditions. The pool has also been dredged and new gravel and sand has been placed.

An excellent location for a small interpretive facility exists at the extreme easterly end of this park overlooking the Canal. A vista area is planned at this location. Three interpretive panels under a weather shelter are also planned at an appropriate location within Bourne Scenic Park.

The plan of development for this area is shown on Plate No. 4 - Bourne Development Areas.

f. The East Boat Basin. 7 acres - 4.3 acres leased to the Town of Sandwich.

Existing Facilities within leased area developed by the Commonwealth of Massachusetts: 150 car parking area, 71 boat slips, 4 boat floats, launching ramp, toilets. Existing facilities within Corps maintained area developed by the Corps of Engineers: 82 car parking area, 6 picnic tables, comfort station, bulkhead (utilized for fishing).

This facility is located in the Town of Sandwich on the south side of the Canal, opposite the East Mooring Basin, and was developed as a cooperative venture by the Corps of Engineers and the Commonwealth of Massachusetts. The principal development is the basin with anchorages 8 feet deep and 13 feet deep. The East Boat Basin is managed by the Sandwich Marina Corporation under a lease arrangement with the Town of Sandwich, which has a 25 year lease from the Corps of Engineers. There are 10 transient and 61 permanent berths available to the public during the summer season from 15 May to 15 October. All berths are occupied throughout the season thus providing over 10,000 berthing days each year. There are between 3,500 and 4,000 launchings from the East Boat Basin every year. Bulkheads constructed along the Canal on either side of the entrance to the basin are heavily utilized for fishing. Proposed development at this area includes an additional comfort station, 6 picnic tables, 12 park benches, and a visitor information shelter with three interpretive



THE BULKHEAD AT THE EAST BOAT BASIN



THE EAST BOAT BASIN

panels.

The Sandwich Jetty at the easterly end of the Canal not far from the East Boat Basin is also popular for fishing. Rehabilitation of this jetty has recently been accomplished under the maintenance program. Development plans are shown on Plate No. 5 - East Boat Basin.

g. The Old CCC Camp. 150 acres.

Existing Facilities: Parking for 40 cars, 13 picnic tables.

Facilities developed by the Corps of Engineers.

This area consists of approximately 150 acres of land on the south side of the Canal about 1.5 miles east of the Bourne Bridge. A large portion of the area is a gravel pit used for maintenance at the Canal. The highway on the south side of the Canal between the Sagamore and Bourne Bridges, U.S. Route 6, provides access to the area. The picnic area, located along the highway, is attractively wooded. Activity is of the day use type with a large proportion of use by groups. An interpretive panel is also proposed to be located here.

This area has been recommended for a camping development by the Bureau of Outdoor Recreation and a campground of about 120 tent and trailer sites could be accommodated. Development potential is dependent upon a major rehabilitation program which will include grading of 25 acres of the gravel pit, and fertilizing,

seeding, and reforesting with trees, common to the area. The results would improve the appearance and make it suitable for future use and development.

However, because of the rehabilitation work required, a detailed development plan will be prepared at a later date and will be submitted as a supplement to this Master Plan.

The Old CCC Camp is shown on Plate No. 4 - Bourne Development Areas

h. Bourne Recreation Area. 33 acres.

Existing Facilities: Indoor ice skating rink, parking area.

Facilities developed by the Bourne Recreation Authority.

Located east of the Bourne Bridge on the Cape side of the Canal is a tract of land leased by the Bourne Recreation Authority for recreational facility development. The proposed development will be operated in conjunction with Bourne Scenic Park and include the recently completed indoor ice skating rink, and future tennis courts, ball fields, outdoor music shell and other athletic facilities in addition to ample parking areas. Part of this development will be financed by the Bourne Recreation Authority and part will be cost shared with the Federal Government.

A schematic plan of development is shown on Plate No. 4 - Bourne Development Areas.

i. Bourne Bridge South. 17 acres.

Existing Facilities: Comfort station, parking area for 31 cars,

2 picnic tables. Facilities developed by the Corps of Engineers.

This area is located on the south side of the Canal under the Bourne Bridge. The adjacent parking area and Comfort Station are used mainly by fishermen and picnickers. The New York-New Haven and Hartford railroad, now part of the Penn Central system, passes through this area, parallel to the Canal at an average distance of 100 feet from the Canal bank. The railroad tracks also separate the proposed Bourne Recreation Area from the Canal thus inhibiting access to the Canal from these recreation areas. No further development is planned for the Bourne Bridge South access area other than the addition of more picnic tables.

This area is shown on Plate No. 4 - Bourne Development Areas.

j. Railroad Bridge South. 4 acres.

Existing Facilities: Comfort Station, 4 picnic tables, parking for 56 cars. Facilities developed by the Corps of Engineers.

This popular fishing spot is located at the south end of the Railroad Bridge across from the Corps' Administration Area. An interpretive panel is proposed here and the limits of the access road, parking and Government-owned land will be marked with suitable shoulders or fences.

k. Canal Service Roads

The Corps of Engineers maintains a road at the top of the bank on both sides of the Canal for access and maintenance purposes. These service roads are also used by fishermen and anglers and many popular fishing spots along the Canal can only be reached by

the service roads. Consideration will be given to providing improved access to the coast, sightseers and fishermen at existing access points and to further encourage recreational use. These will be detailed in a later version of the General Plan.

In several locations the existing utility lines are rather unattractive in appearance and in some cases obstruct the view. They are particularly ugly and distracting at the Herring Run and Bourne Water Park. Since these utility lines are near the end of their lives and will have to be replaced in the near future, consideration will be given to providing underground utility lines and more attractive light poles near recreation areas. The cost of putting the new lines underground would not greatly exceed that of replacing the existing lines above ground.

Access points to the access points would be provided at the following locations: Bourne Water Park, Bourne Point, the Herring Run, Bourne Water Park and Bourne Point, at Station 10 where the town road meets the service road, and at the road bridge, all on the north side of the canal.

Development of the Canal

Development of the canal and its tributaries will be undertaken as funds are available, either from the town or from grants.

Development of the Canal and its Tributaries

Development of the canal and its tributaries will be undertaken as funds are available, either from the town or from grants. The need for improvement, expansion and further development of the canal and its tributaries will be determined by the town and its residents and will be carried out in a regular, continuing manner.

FY 75 improvements all new work will be cost shared under a formal contract as offered by this Master Plan.

b. Corps Maintained Access Sites.

The upgrading and improvement of existing facilities at public use access areas partly with O&M funds, are planned to be accomplished in the following order of priority: Herring Run, Sagamore East, Bournedale Hills, Old CCC Camp. These areas of minimal development are for general visitation and access and are operated and maintained by the Corps of Engineers. Additional recreation facilities must be cost shared with non-Federal interests in order to complete development of these areas.

c. Commercial Development - East Boat Basin.

The existing leases to commercial fish processors at the East Boat Basin will be phased out as early as practical since they interfere with planned public use development.

3. Cost Estimates

The estimated cost for additional facilities and improvements required to complete the future plan of development at the Cape Cod Canal is \$2,088,000. \$841,000 of this will be Federal and \$1,247,000 will be non-Federal. A complete breakdown of all cost estimates is contained in Section XIV of this Master Plan.

VII. FACILITY LOAD AND DESIGN CRITERIA

1. Siting

All future recreation development will be planned, designed and located with consideration given to environmental and aesthetic qualities, type of use, amount of visitation and the ability of the

area to assimilate activities to avoid overuse, incompatibility and congestion. All structures will be designed to harmonize with the environment.

2. Water Systems

Except for the Herring Run, all of the public use access areas have town water. The Herring Run facilities are supplied by a well.

3. Waste Collection and Treatment Systems

Waste treatment at all recreation sites is by septic tanks and leaching fields. Improvements to some of the facilities at Bourne Scenic Park have recently been completed as excessive use had overloaded the treatment capacities at times during the peak summer season.

Existing sanitary facilities on project lands consist mainly of the waterborne sewage type with flush toilets in all comfort stations. Any new comfort stations will also be of the waterborne sewage type. These facilities will be approved by the Massachusetts Department of Public Health and the Environmental Protection Agency to assure compliance with Executive Order 11288, 2 July 1966, Section 4 - General Standards. At the present time, there is no danger of pollution of the project waters from abutting land owners. Constant surveillance will continue to be maintained to prevent pollution in these areas.

4. Roads

The roads leading to all access areas are paved and meet all State, Town or Corps specifications as the case may be. No new

roads are planned at any of the recreation areas, although improvements to existing roads are scheduled at Bourne Scenic Park. The Commonwealth of Massachusetts has provided paved roads within their camping development at Scusset Beach State Park.

5. Parking Areas

Existing parking areas are generally large enough at each access area and in several cases have been modified and improved by installing curb and resurfacing.

6. Boat Launching Ramps

There is presently only one boat launching area at the Cape Cod Canal. The two lane ramp at the East Boat Basin is available to the public although all of the boat mooring facilities within the basin are on a reservation basis. The ramp can be used at high or low tide and there is adequate parking for cars and trailers.

The Commonwealth of Massachusetts has expressed interest in development of another marina and boat launching facility at the Canal near Scusset Beach, but no specific plans are available to date concerning this proposal.

7. Docks, Piers and Mooring Facilities

The East Boat Basin, as previously mentioned, is the only place on Federal land in the Canal area where boats can be launched or moored by the public. There is a long waiting list for mooring facilities as the basin simply is not large enough to meet the ever increasing demand from recreational boaters. The Town of Bourne

and the State of Massachusetts are presently planning the development of a marina at Buttermilk Bay which will be a valuable asset to the Canal area. It will probably be operated under the jurisdiction of the Town in a manner similar to the East Boat Basin, which is operated by the Sandwich Marine Corporation under a third party lease from the Town of Sandwich.

8. Picnic Units

Adequate picnic facilities are available at each appropriate access area and are planned to complement other recreational opportunities. Picnic tables and trash receptacles are provided at every picnic area, but fireplaces are only available at somewhat secluded places where there is not a heavy concentration of people and activity.

9. Camping Units

Bourne Scenic Park and Scusset Beach State Park are the only areas designated for camping at this project. Each camp site or unit includes a trailer pad or place to pitch a tent, a picnic table and fireplace and nearby water and sanitary facilities. Comfort stations, water faucets and trash receptacles are conveniently located in the camping areas. Sewage disposal stations for trailers are also provided at convenient locations.

10. Swimming Beach

Scusset Beach and Sagamore Beach are the only public swimming areas along the Canal. They are natural beaches on Cape Cod Bay and Due to the colder water on the north side of the Cape, do not receive

heavy use. There is a large bath house, plenty of parking and a long, sandy beach in addition to the camping area, fish pier and concessions at Scusset Beach which is operated by the State. Sagamore Beach is not part of the Federal land at the Canal and is maintained by the Town of Sandwich.

11. Comfort Stations, Visitor Center, Etc.

Comfort stations have been provided at all public use areas except Bournedale Hills, which is primarily an overlook area. At Bourne Scenic Park four new comfort stations and one trailer dump station will be constructed and available for public use in 1975. A new bath house-comfort station combination has recently been constructed near the tidal swimming pool.

The Scusset Beach bath house, and the concession stand located at the fish pier, are relatively new and entirely adequate at this time. Both are operated and maintained by the State. A much needed visitor information center is planned at The Herring Run and will be a valuable addition to visitor guidance at the Cape Cod Canal.

12. Overlook Areas

Several overlook areas are located along both sides of the Canal. The principal areas have paved parking facilities and trash receptacles while many of the smaller overlooks offer only a gravel parking area off the main highway, U.S. Route 6. All overlook areas were provided by the Massachusetts Department of Public Works as stopping places along the highway for sightseers. The best view of the Canal is

at Bournedale Hills where the Corps has provided picnic tables, park benches and visitor information display signs with vital statistics about the Canal. A memorial to August Belmont, who constructed the original Canal, is also located at Bournedale Hills.

13. Playground Facilities

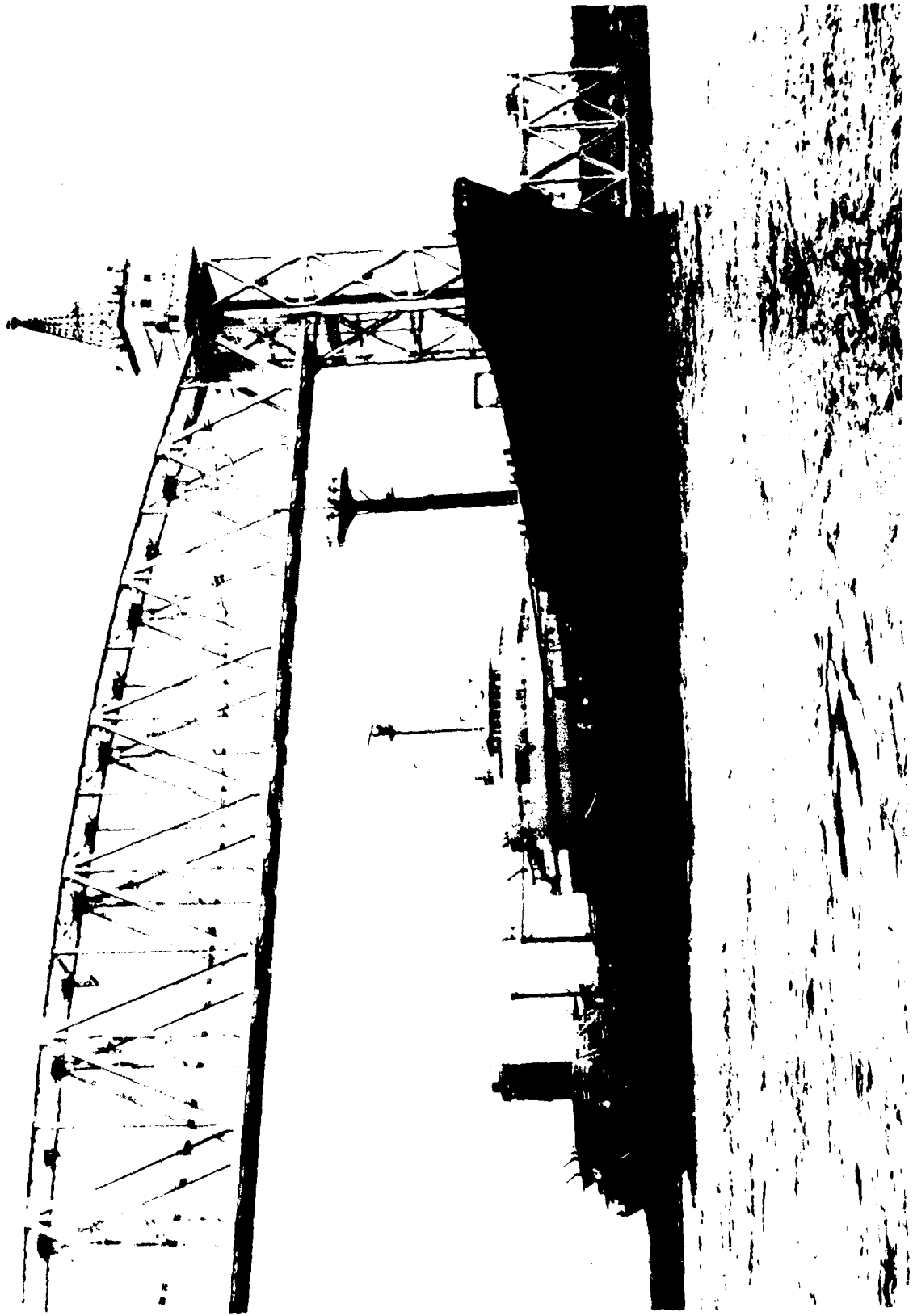
Playground facilities for children are available at Bourne Scenic Park and Scusset Beach State Park and were provided by the Town of Bourne and the State, respectively.

14. Railroad and Highway Bridges

The Buzzards Bay Vertical Lift Railroad Bridge is a single track span 544 feet in length, the second longest in the world. It was constructed for and under the supervision of the Corps and put into operation in 1935. The bridge is normally kept in an open or raised position except for the passage of trains or for maintenance purposes. It serves the Penn Central Transportation Company and is operated by the Railroad on a 100% reimbursable basis by the Government.

The two highway bridges which cross the Cape Cod Canal were erected as part of the general improvements undertaken in the 1930's. They replaced drawbridges which spanned the old 100 foot wide canal. The new Bourne and Sagamore Bridges each have a horizontal clearance of 550 feet and vertical clearance of 135 feet above mean high water, the same as the Railroad Bridge. Both bridges have 40-foot-wide roadways and a six-foot-wide sidewalk.

Highway traffic has increased over the years to volumes almost



SHIP PASSING UNDER THE RAILROAD BRIDGE

undreamed of at the period of construction, thus traffic jams do occur frequently during the summer. This has led to planning considerations for a third bridge, but to date no definite plans have been formulated by the Massachusetts Department of Public works and other interests. The present bridges are maintained by the New England Division, Corps of Engineers.

15. Electrical Distribution

Electrical power from local sources is supplied to all facilities at the various recreation and access areas along the Canal. Both banks of the Canal are lighted as an aid to navigation and both highway bridges over the Canal are well lighted.

16. Trails

The Corps of Engineers service roads along both sides of the Canal are used by bicyclists, hikers, fishermen and those who just like to walk. No vehicles except Corps or other authorized maintenance vehicles are permitted on the service roads, which are very popular with sightseers.

The State of Massachusetts Department of Natural Resources has proposed to utilize the existing railroad bed between the Cape Cod Canal and the Cape Cod National Seashore for a walking trail if and when the railroad is abandoned by the Penn Central System. The railroad tracks run parallel to the south bank of the Canal and cross at the railroad bridge in Buzzards Bay. It is anticipated that the railroad bed could be developed into a very popular scenic

trail.

17. Landscaping

This Master Plan proposes the employment of a landscaper and crew as a permanent segment of the Canal operations staff. Upon implementation of this proposal, the crew will initiate the beautification features of the Master Plan. Priorities of assignment will be in the vicinity of the most heavily used areas such as The Herring Run, East Boat Basin and Scusset Beach. A continuing development and maintenance program will be necessary on these and other public use areas as well as on the eroded areas of the canal Banks. In addition to the landscaping features discussed in section VII, Plan of Development, several other areas require specific landscaping plans.

a. East Breakwater Area. This area adjoins Scusset Beach, which is leased to and operated by the Commonwealth of Massachusetts. It receives heavy use by fishermen and sightseers. At present the limit of the Government reservation is rather haphazardly defined by fences and signs. It is proposed to relocate the fences, provide access gates more convenient to users, and to eliminate some unnecessary signs. Further, debris consisting of buried cables, some steel bars and timber will be removed.

b. Sagamore Bridge Area. Government owned land stretching westerly from the north abutment of the Sagamore Bridge to the Mussel Bed (a local fishing spot) is partly wooded, and partly covered with sparsely growing grass. This comprises about 30 acres of land. Some erosion is occurring in the area and when viewed from the opposite Canal bank, the appearance is rather stark and barren. It is proposed

to fertilize these sparsely grassed areas to promote a more vigorous grass cover, invite volunteer woody growth and thus eliminate the erosion and promote a more pleasing appearance.

c. The Herring Run. At the westerly end of the Herring Run area there is a fish ladder to allow passage of the herring upstream. The slopes around the fish ladder are steep and due to pedestrian traffic are eroded in several places. An extremely ugly six foot high chain link and barbed wire fence, or cage, has been erected around the lower fish ladder which should either be removed or replaced with a much smaller and attractive type of decorative fence.

At present, a highway type wire cable and concrete post guard rail runs along the Canal side of the Herring Run channel. A protective fence is necessary here, because of the approximately six foot drop into the concrete walled channel. This type of fence is not compatible with the use of the area. It is proposed to remove it and replace it with a four foot high green vinyl coated chain link safety fence.

In the same location pedestrian traffic is heavy, because of the many people who walk along the channel viewing the herring going upstream. A path has been worn in the earth, with jagged edges, producing an unsightly and often unsafe condition. It is proposed to install a paved (bituminous) walk in this location with a more suitable alignment and safety fence.

A gravel surfaced area exists between the curbed highway and the fence which delineates the government property. This area

extends from the westerly limits of the Herring Run area to a line easterly of the comfort station. It is proposed to eliminate the gravel surface in front of the comfort station and extend the grassed area to the highway curb. Westerly of this grassed area, the present gravel surface is to be paved, and used for parking. A suitable access will be provided at each end of the paved surface. A narrow divider strip, approximately three feet wide, will be provided between the highway and the paved area and a barrier rail installed.

A gravel drive giving access to the Canal service road enters the highway at an angle just easterly of the comfort station. In addition, a gravel surface of no particular form or dimension exists here, across which pedestrian traffic must go to reach the comfort station. It is proposed to eliminate and fill in the approach to the Canal service road, and to relocate it if necessary at the east end of the parking area. This area will then be topsoiled and seeded, and a bituminous walk provided between the parking area and the comfort station.

A portion of an old paved road runs across the grassed area westerly of the comfort station. This pavement will be removed to a depth of 6 inches, replaced with topsoil and seeded.

Easterly of the comfort station, three open pits exist at locations where changes in the gradients of surface drainage pipes occur. Because of the approximate four foot depth of the pits, they are fenced in. It is proposed to eliminate these pits, with appurtenant walls and fences, by installing suitable manholes. Thus

a rather unsightly and hard to maintain feature of the area will be eliminated.

Because of heavy pedestrian traffic now passing uncontrolled up and down the grassed Canal slopes, with consequent destruction of vegetal cover and erosion, it is proposed to extend the fence along the top of the Canal side slope.

The large parking area easterly of the comfort station is now contiguous with the highway, with no separation from it. Consequently, traffic can break out of the high speed flow on the highway and enter the parking area at any point and at any speed. Likewise, traffic can leave the parking area at any point and at any speed. In addition, the appearance of the area is not aesthetically satisfactory.

Some additional landscape planting, judiciously chosen and placed, will be provided to enhance the appearance of the area and to provide more shade. Rugosa rose, hydrangea, juniper and yew are examples of shrubs to be used. Oak, london plane tree and locust are examples of shade trees.

18. Signs

That part of the Cape Cod Canal area under the jurisdiction of the Corps of Engineers presently lacks a well coordinated system of directional and information signs. Few of the heavily used access areas, public-use developments, and points of interest are designated or named and there are no road signs to indicate where these areas are. Information as to what facilities are available to the public is needed. In some cases people are discouraged from enjoying

the recreation areas by totally unnecessary warning signs such as "U.S. Government Reservation - Enter at Own Risk". A system of permissive signs rather than negative signs would be much more appropriate.

It is proposed to eliminate all unnecessary and negative signs except where they are especially needed for safety purposes. At several areas there are as many as five or six signs warning the public that they are using Corps' facilities at their own risk. Access areas should be properly identified and available recreation activities should be posted in such a way that motorists will know where picnic areas, bicycle trails, boat-launching ramps, etc., are located. A series of standardized symbols has been devised which designate what and where recreational facilities are available. These symbols have been designed so that they will be universally understood by all and still be as simple as possible. Each activity is designated by a silhouette or outline on the sign. This will help identify the activity by either the figure which is sometimes more recognizable by the passing motorist. The signs will be large enough to be seen at a reasonable distance and small enough so that they will not be an obstruction or an intrusion on the environment.

At appropriate points throughout the Canal area, these symbols will be placed for the convenience of the traveling public. All Corps operated, maintained and leased areas will thus be sufficiently identified and the emphasis put upon making people welcome to use

the area instead of warning them of the "freaky hazards" that await them if they wish to enjoy the facilities. A guide key will be provided at each heavily visited area with a complete alphabetical listing of what is available at each area. This entire sign program will be a significant and simple improvement over the existing system.

19. Interpretive Exhibits

Several interpretive exhibits consisting of tourist information panels and weather shelters are planned at Bourne Scenic Park, The East Boat Basin, Scusset Beach State Park, The Herring Run, Sagamore East, The Old CCC Camp and the Railroad Bridge South. These panels will contain information on the history of the Canal, shipping and boating, fishing and general location of recreation areas and facilities.

20. Navigation Aids

Adequate navigation aids clearly mark the Cape Cod Canal and approach channels for the benefit of commercial shipping as well as pleasure craft. The Corps of Engineers also patrols the area continuously.

21. Waste Disposal

Trash cans and comfort stations with flush toilets are provided at all public recreation areas at the Canal. Trailer dump stations are located at Bourne Scenic Park and at Scusset Beach State Park.

22. Visitor Facilities and Safety Features

In addition to the usual picnic and sanitary facilities provided

at each access area adequate safety controls such as protective fencing, guardrails, stairways and railings have been constructed or are planned at each area where necessary. Facilities particularly suited for use by the elderly or handicapped are the Scusset Beach fish pier and the Canal service roads, which have become popular shoreline walkways.

IX. SPECIAL PROBLEMS

1. Natural Resource Preservation

Every effort is being taken to preserve and protect the remaining natural resources in the Cape Cod Canal area. It is proposed in this Master Plan to limit development in several areas, to avoid disturbing the valuable sand dunes and beach grass at Scusset Beach, to stabilize the eroded banks near the mainland side of Sagamore Bridge, to control pedestrian access at the Herring Run in order to protect existing vegetation, and to provide suitable landscaping at all areas.

2. Fish and Wildlife Resources

The only significant wildlife resource at the Cape Cod Canal is the pheasant habitat at Scusset Beach State Park. The Massachusetts Division of Fisheries and Game stocks pheasants in this area which affords good cover and is popular with hunters. There is very little other undeveloped land at the Canal which is suitable for wildlife habitat or cover.

The fishery resources at the Cape Cod Canal are tremendous. The 15 miles of Canal shoreline open to fishermen are intensely used by the public. Areas near the Herring Run and at the Canal entrances are those most heavily fished. Stone-lined embankments, a bulkhead and a fishing pier also allow good fishing. No fishing is permitted from boats in the Canal and fish and game laws of the United States and the Commonwealth of Massachusetts are in force.

The fisheries resource is varied and abundant. The Cape Cod Canal is best known as one of the four or five top striped bass "hot spots" along the North Atlantic coastline. The stripers move into the Canal in mid-May, feeding during the fabulous herring runs, and remain there in varying degrees of abundance until October. The Canal is particularly renowned for large bass in the 10 to 30 pound category. For example, on Memorial Day, 1965, it was estimated that fishermen caught over a thousand fish in the Canal. Fishing is seldom this good anywhere, but the Canal's reputation is sufficiently established to attract thousands of anglers from throughout the East.

What is less known is that the Canal and jetties are fished by thousands of people who just go fishing and seldom if ever catch a glamorous striper. These people do, however, catch cod, tautog, perch, mackerel, pollack and flounder in uncountable numbers.

3. Historical Resources

There are no archeological or historical resources at the Cape Cod Canal, although the general area does have historical significance dating back to the Pilgrims. For further information see Appendix A.

4. Fee Systems and Collection

The only public use areas at the Cape Cod Canal which are not open to the public free of charge are Bourne Scenic Park and Scusset Beach State Park. The State charges \$1 per car at Scusset Beach for use of all facilities during the summer recreation season. There is no charge in the off Season. The camping fee at Scusset Beach is \$5.00 per day including electricity. The camping fee at Bourne Scenic Park is \$3.00 per day and the charge for use of only the swimming pool and picnic area is \$1.50 per car.

The Sandwich Marina Corporation, who leases the East Boat Basin, charges a fee of \$1.50 to launch a boat.

5. Special Land and Water Uses

a. Power Generation

The generating station operated by the Canal Electric Company adjacent to the East Boat Basin presents serious problems regarding the ecological and aesthetic integrity of the Cape Cod Canal. Two additional plants similar to the two existing ones are planned for the future. This development will further degrade the aesthetic quality of the vistas from Scusset Beach and the East Boat Basin. The increased chances of oil spills in fueling the generating complex and the possibility of more extensive spills present added threats to the aesthetics and ecology of the Cape Cod Canal and surrounding areas.

Air pollutants have been decreased by the addition of precipitators so there are no visible emissions from the plant. Thermal pollution will be minimized by diffusing discharges of heated water into the Canal. The periodic introduction of chlorine to the condenser system to control algae is not expected to be harmful to aquatic life, although the addition of more units in the future could increase present problems.

b. Private Land Development

A view of the Canal and its busy boat traffic has proved to be an attraction for extensive development of homes on private lands adjacent to portions of the government holdings. In most instances, pride of ownership is exhibited by well kept homes and grounds. Continual coordination is required between the Corps and town officials to maintain and improve the environmental quality of these private lands, which are a vital part of the landscape.

c. Commercial Development

The Cape Cod Canal is the gateway to one of America's most popular resort areas and there is considerable pressure to use project land and adjacent land areas for development of commercial tourist facilities. The towns of Bourne and Sandwich have zoning plans for adjacent land areas for development of commercial tourist facilities which are subject to continuing change as a result of the above mentioned pressures. This Master Plan contains land allocation and development proposals for outdoor recreational use of project land areas to help meet the needs of Cape Cod tourism.

(1) East Boat Basin. The general plan of this basin is shown on Plate No. 5. There are several leases to commercial interests for various purposes. The leases do not enhance the public utilization of this important area and compliance inspections during the past several years have indicated drastic inconsistencies of the leases with lease agreements. These leases have not proven worthy of renewal and they are now being discontinued on a gradual phasing out schedule. The actual amount of Corps land in the basin is small but its potential is great.

(2) Commercial Marina Developments. There have been numerous proposals for development of marinas along the Canal. No marina can be permitted in the Canal cut as it would encroach on the channel and be detrimental and hazardous to navigation. Various interests have expressed the desire to create pleasure boat access from the Canal to basins to be developed on adjacent public land holdings. Of particular interests is the development of a basin in the vicinity of Bourne Pond. Any such development will not be discouraged, however adequate provisions would have to be made for entrance and departure with suitable warning and control so as not to interfere with navigation in the Canal itself.

Another proposal for a marina is being considered by the Town of Bourne and the State of Massachusetts at Bourne Neck on Buttermilk Bay near the west entrance to the Canal. The marina would be located very near the Corps administration building in the village of Buzzards Bay.

d. Fishing Facilities

With the exception of sightseeing, fishing is the most popular activity in the Cape Cod Canal area. Fishing has accounted for over 300,000 visitors annually at the Canal since 1963. At the present time there are limited fishing facilities available and many people, especially the elderly and handicapped, find it increasingly difficult to enjoy the opportunities that should be available to all. Existing fishing facilities consist of the bulkhead at the East Boat Basin and the State fishing pier near Scusset Beach. Both are heavily used and inadequate. The vast majority of the fishermen are therefore found along the Canal banks, jetties and breakwaters. Sufficient access and parking, however, is unavailable at many of the most popular fishing spots.

X. PROJECT RESOURCE MANAGEMENT

1. Operation Policies

The general policies with regard to the Cape Cod Canal are designed to provide for orderly and planned development for public use of the recreational resources of the project and to insure that in future years these resources will remain and that future needs for recreational development will be met. The governing policies for recreational development are contained in the Corps of Engineers engineering regulations and manuals and the rules and regulations governing public use of certain areas administered by the Corps of Engineers as published in Section 311.1, Title 36, Chapter 3 of the

Federal Code of Regulations. At Bourne Scenic Park and at Scusset Beach State Park, the rules and regulations governing public use are in accord with the Federal Code of Regulations and have been approved by the Division Engineer. The rules are posted throughout the parks and compliance with these rules are enforced by the lessees. Rules and regulations governing fishing and hunting licenses and season of use are in accordance with applicable laws of the Commonwealth of Massachusetts.

2. Staffing and Organization

In addition to operating the Canal for navigation purposes, the field personnel at the Cape Cod Canal are also concerned with direct management and supervision of the recreational program. They supervise the use of lands and waters of the project, investigate and report the extent of compliance with the terms of leases, concessions and permits; protect and maintain Government property; and require high standards of public health and safety. The field forces are provided with a field manual outlining their responsibilities and duties. Adequate management of the proposed public use development will require the employment of additional seasonal help. As the intensity of use continues to rise, it is proposed to increase the number of employees during the recreation season to perform duties related to such public use.

Present staffing at the Canal is not adequate to carry out the desired programs discussed in this Master Plan. Additional personnel



FISHING AT THE CAPE COD BAY ENTRANCE TO THE CANAL



FISHING PIER AT SCUSSET BEACH

in specialized fields will be required in the future to bring the Canal staff up to full operating capability if the potential recreation resources at this project are to be developed properly.

3. Administration and Maintenance

The administration of the recreation and conservation program at the Cape Cod Canal will be carried out jointly through the Corps of Engineers, New England Division office and field personnel of the Cape Cod Canal office. Division personnel are concerned mainly with determination of the nature and extent of development; preparation of site layouts and construction requirements; initiation, coordination and reconciliation of activities relative to policies and regulations; public relations with other interests; management, leases, licenses and permits.

At leased areas, the lessees will be responsible for administration of their respective areas, subject to Corps of Engineers approval of their program.

Restoration and reforestation will be performed by a landscaper and crew employed on a permanent basis as part of the proposed organizational staff of the Cape Cod Canal. They will make use of native vegetation in rehabilitating and beautifying the land area adjoining the Canal. The landscape crew will be responsible for maintaining all Corps of Engineers operated recreation facilities and access areas.

The Corps of Engineers will maintain the service roads and the strip of land along the roads and the Canal. This includes landscaping

at all Corps areas. Day use areas will be operated and maintained by Corps personnel where not leased to the State or Town.

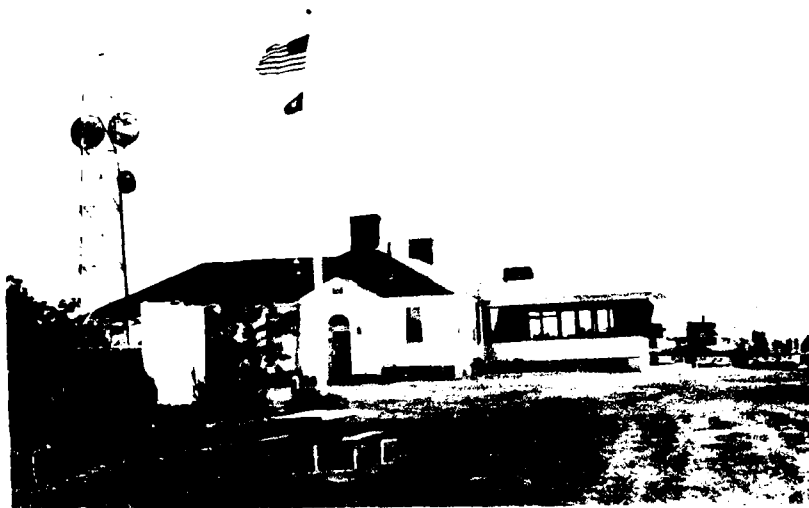
The Massachusetts Department of Natural Resources holds a lease at Scusset Beach State Park and operates and maintains the public recreation facilities at that area. The Bourne Recreation Authority and the Town of Sandwich manage areas leased to them for public recreation at Bourne Scenic Park and the East Boat Basin, and it is anticipated that these leases will continue to be renewed.

Project boundaries have been established in accordance with current policies and availability of funds. Priority will be given to marking boundaries adjacent to structures, public use areas and improved lands in private ownership. A major portion of the project boundaries follow highway rights-of-way and do not require monumentation. The remaining areas requiring boundaries will be established as soon as funds allow, in order to utilize existing boundary markings and prevent encroachment by others.

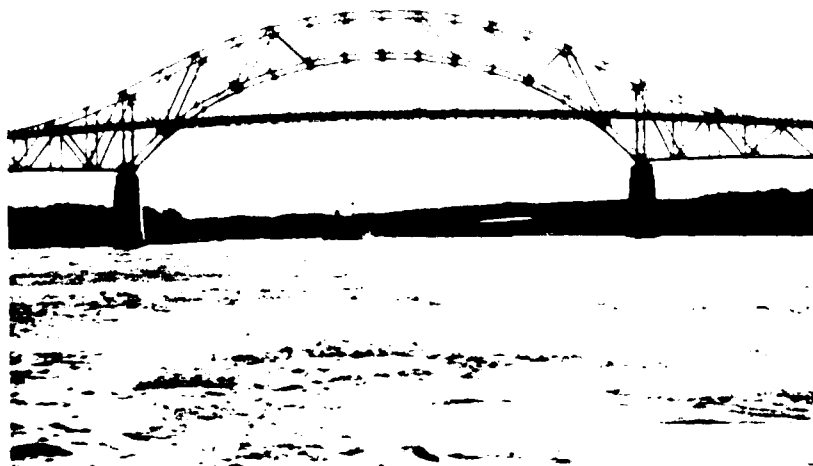
4. Law Enforcement

The lands around the Cape Cod Canal are patrolled 24 hours a day in an effort to control vandalism and insure public safety. In addition to authorized Corps personnel, assistance is readily available from the local police departments and the State Police when needed.

Presently, the Corps of Engineers maintains a staff of police in traditional blue police uniforms who patrol the Canal properties.



CORPS OF ENGINEERS ADMINISTRATION BUILDING



THE BOURNE BRIDGE

The former practice of carrying side arms has been discontinued.

In actuality police power is not needed as the Canal roads are patrolled only to encourage proper use. To present a better image of the Corps of Engineers and to create a more pleasing environment to the public, it is recommended that the police uniform be replaced with green uniforms of the tradition of a ranger or conservation officer.

5. Safety

See Section XIII.--Project Safety.

6. Concessions

The only concessions at the Cape Cod Canal are a small bait and tackle shop in combination with a comfort station at the fish pier at Scusset Beach State Park and a snack bar at the beach bath house.

These are operated by the Commonwealth of Massachusetts.

7. Visitor Information

Visitor information pamphlets are available to the public at the Corps of Engineers Administration Building located next to the Canal in Buzzards Bay. A model of the Cape Cod Canal is also located here.

The most practical way to inform a tremendous volume of visitors of the recreation opportunities on Canal lands and to direct them to these places is the proper placement of informational and directional signs. These signs would be of a permissive nature and could note a friendly invitation to tarry and utilize the Canal's recreational facilities. It is recognized that some prohibitive or warning signs

will be needed for Canal operations. However, these should be limited in number and only placed in those locations where the Engineer in Charge of the Cape Cod Canal feels they are needed.

XI. FIRE PROTECTION

Forests cover most of the land area on the south bank of the Canal which is contiguous to Otis Air Force Base (Camp Edwards). The danger of forest fires is ever present and public recreational use tends to increase this hazard. Fires are permitted only in areas provided with fireplaces and all fires must be extinguished before visitors leave the area.

The fire protection and suppression services of the towns of Bourne and Sandwich, Massachusetts Division of Forests and Parks and Otis Air Force Base are available. Roads throughout the Canal lands will be maintained in a manner adequate to permit access to fire fighting equipment. There is also a State fire tower on Bourndale Hill.

XII. FISH AND WILDLIFE MANAGEMENT

Management of the fish and wildlife resources at the Cape Cod Canal is under the jurisdiction of the Massachusetts Division of Fisheries and Game, with cooperation from the Division of Marine Fisheries. Present management programs are discussed in Section IX. 2.-- Fish and Wildlife Resources.

XIII. PROJECT SAFETY

Project personnel at the Cape Cod Canal are responsible for developing plans and programs designed to implement and enforce safety regulations and requirements. A hazard-free environment for both Corps personnel and the visiting public is of the utmost importance.

Safety equipment and training as well as buoys, markers, signs and barricades at appropriate locations are provided at this project.

XIV. COST ESTIMATES

SUMMARY OF PUBLIC USE DEVELOPMENT

LOCATION	TOTAL EXISTING COST		TOTAL FUTURE COST		TOTAL COST	
	FEDERAL	NON-FEDERAL	FEDERAL	NON-FEDERAL	FEDERAL	NON-FEDERAL
Railroad Bridge South	\$17,000	\$ 0	\$ 2,000	\$ 0	\$ 19,000	\$ 0
Old CCC Camp	1,500	0	189,000	0	190,500	0
Bournedale Hills	600	0	11,000	0	11,600	0
Sagamore East	25,000	0	26,000	0	51,000	0
East Boat Basin	433,000	300,000	71,000	0	504,000	300,000
Herring Run	31,850	0	127,000	127,000	158,850	127,000
Bourne Scenic Park	90,000	N.A.	247,000	247,000	337,000	N.A.
Scusset Beach State Park	0	N.A.	41,000	0	41,000	N.A.
Bourne Bridge South	14,000	0	0	0	14,000	0
Bourne Recreation Area	0	0	0	1,000,000	0	1,000,000
Total - All Areas	612,950	N.A.	714,000	1,374,000	1,326,950	N.A.

N.A. - Not Available

The predicted annual operation and maintenance and replacement costs at the Federal recreation areas at the Cape Cod Canal is \$75,000.

THE HERRING RUN

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Site Improvement	L.S.	\$ 6,350	1	\$ 1,700	1	\$11,000	2	12,700
Drinking Water	L.S.	2,500	1	1,000	1	4,000	2	5,000
Comfort Station	EA.	15,000	1	15,000			1	15,000
Picnic Tables	EA.	100	8	800			8	800
Park Benches	EA.	50	9	450			9	450
Stairways	EA.	1,440	5	7,200			5	7,200
Decorative Fencing	L.F.	8			800	6,400	800	6,400
Visitor Center	L.S.	100,000			1	100,000	1	100,000
Bituminous Walks	S.Y.	4			3,800	15,200	3,800	15,200
Parking Improvement	S.Y.	4.80			3,200	15,400	3,200	15,400
Fill, Topsoil, Seeding	L.S.	2,000			1	2,000	1	2,000
Landscaping	L.S.	10,500			1	10,500	1	10,500
Drainage Improvement	L.S.	1,500			1	1,500	1	1,500
Interpretive Panels	EA.	1,000			5	5,000	5	5,000

THE HERRING RUN (Con't)

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Curbing	L.F.	3			1,400	4,200	1,400	4,200
Sub-total				\$26,150		\$175,200		\$201,350
Contingencies				600		35,800		36,400
Construction Cost				\$26,750		\$211,000		\$237,750
E & D and S & A				5,100		43,000		48,100
Total Cost				\$31,850		\$254,000		\$285,850
Federal Cost				\$31,850		\$127,000		\$127,000
Non-Federal Cost				0		\$127,000		\$127,000

BOURNEDALE HILLS

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Picnic Tables	Ea.	\$100	4	\$400	6	\$ 600	10	\$1,000
Park Benches	Ea.	50	4	200			4	200
Paved Walks	S.Y.	4			600	2,400	600	2,400
Shade Trees	L.S.	1			1	1,200	1	1,200
Fencing	L.F.	8			300	2,400	300	2,400
Paved Gutter	L.F.	5			200	1,000	200	1,000
Sub-Total				\$600		\$7,500		\$8,200
Contingencies				0		1,500		1,500
Construction Cost				\$600		\$9,100		\$9,700
E & D and S & A				0		1,900		1,900
Total Cost (All Federal)				\$600		\$11,000		\$11,600

BOURNF BRIDGE SOUTH

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Comfort Station	Ea.	\$10,000	1	\$10,000			1	\$10,000
Picnic Tables	Ea.	100	2	200			2	200
Road Improvement	L.S.	1,700	1	1,700			1	1,700
Sub-Total				\$11,900				\$11,900
Contingencies				0				0
Construction Cost				\$11,900				\$11,900
E & D and S & A				2,100				2,100
Total Cost (All Federal)				\$14,000				\$14,000

SACAMORE EAST

ITEM	UNIT	COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Site Improvement	L.S.	\$ 1,800	1	\$ 1,800			1	\$ 1,800
Paved Parking Area	S.Y.	4	1000	4,000			1,000	4,000
Comfort Station	EA.	15,000	1	15,000			1	15,000
Drinking Water	L.S.	1,000	1	1,000			1	1,000
Picnic Tables	EA.	100	2	200	6	\$ 600	8	800
Decorative Fencing	L.F.	8			1,000	8,000	1,000	8,000
Granite Curb	L.F.	4.50			1,000	4,500	1,000	4,500
Interpretive Panel	EA.	1,500			1	1,500	1	1,500
Landscaping	L.S.	2,500			1	2,500	1	2,500
Sub-Total				\$22,000		\$18,100		\$40,100
Contingencies				0		3,600		3,600
Construction Cost				\$22,000		\$21,700		\$43,700
E & D and S & A				3,000		4,300		7,300
Total Cost (All Federal)				\$25,000		\$26,000		\$51,000

BOURNE RECREATION AREA

ITEM	UNIT	EXISTING		FUTURE		TOTAL	
		UNIT	COST	QUANTITY	COST	QUANTITY	COST
All Facilities	L.S.			1	\$1,000,000	1	\$1,000,00
Total Cost (All Non-Federal)					\$1,000,000		\$1,000,00

RAILROAD BRIDGE SOUTH

ITEM	UNIT	EXISTING		FUTURE		TOTAL	
		UNIT	COST	QUANTITY	COST	QUANTITY	COST
Comfort Station	EA.		\$13,000	1	\$13,000	1	\$13,000
Drinking Water	L.S.		1,000	1	1,000	1	1,000
Picnic Tables	EA.		100	4	400	4	400
Interpretive Panel	EA.		1,500				
				1	\$1,500	1	1,500
Sub-total					\$14,400		\$15,900
Contingencies					0		200
Construction Cost					\$14,400		\$16,100
E & D and S & A					2,600		300
							2,900
Total Cost (all Federal)			\$17,000		\$2,000		\$19,000

THE OLD CCC CAMP

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Picnic Tables	EA.	\$ 100	13	\$1,300	20	\$ 2,000	33	\$ 3,300
Comfort Station	EA.	40,000			1	40,000	1	40,000
Water Supply Pipeline	L.F.	6			6,000	36,000	6,000	36,000
Fireplaces	EA.	80			20	1,600	20	1,600
Interpretive Panel	EA.	1,500			1	1,500	1	1,500
Borrow Area Reforestation	ACRE	2,000			25	50,000	25	50,000
Sub-Total				\$1,300		\$131,100		\$132,400
Contingencies				0		26,000		26,000
Construction Cost				\$1,300		\$157,100		\$158,400
E & D and S & A				200		31,900		32,100
Total Cost (All Federal)				\$1,500		\$189,000		\$190,500

THE EAST BOAT BASIN

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Boat Basin	L.S.	\$340,000	1	\$340,000			1	\$340,000
Marina Facilities	L.S.	125,000	1	125,000			1	125,000
Gravel Parking	S.Y.	2	7,500	15,000			7,500	15,000
Marina Parking Area	S.Y.	3.50	8,600	30,000			8,600	30,000
Boat Ramp	EA.	10,000	1	10,000			1	10,000
Administration Bldg.	EA.	20,000	1	20,000			1	20,000
Comfort Station	EA.	25,450	1	10,900	1	\$40,000	2	50,900
Drinking Water	L.S.	10,000	1	10,000			1	10,000
Picnic Tables	EA.	100	6	600	6	600	12	1,200
Park Benches	EA.	50			12	600	12	600
Paved Parking Area	L.S.	71,300	1	71,300			1	71,300
Drainage	L.S.	15,100	1	15,100			1	15,100
Landscaping	L.S.	24,600	1	24,600			1	24,600

THE EAST BOAT BASIN (Con't)

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Site Work	L.S.	\$25,500	1	\$25,500			1	\$25,500
Interpretive Panels	EA.	1,500			3	\$ 4,500	3	4,500
Panel Shelter	EA.	3,000			1	3,000	1	3,000
Sub-Total				\$698,000		\$48,700		\$746,700
Contingencies				0		10,300		10,300
Construction Cost				\$698,000		\$59,000		\$757,000
E & D and S & A				35,000		12,000		47,000
Total Cost				\$733,000		\$71,000		\$804,000
Federal Cost				\$433,000		\$71,000		\$504,000
Non-Federal Cost				\$300,000		\$ 0		\$300,000

BOURNE SCENIC PARK

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Campground	Sites	N.A.	342	N.A.			342	N.A.
Gravel Roads	Mi.	N.A.	0.8	N.A.			0.8	N.A.
Paved Roads	Mi.	N.A.	2.1	N.A.			2.1	N.A.
Gravel Parking Area	Spaces	N.A.	90	N.A.			90	N.A.
Bathhouse	L.S.	\$90,000	1	\$90,000			1	\$90,000
Water Supply System	L.S.	N.A.	1	N.A.			1	N.A.
Swimming Pool	L.S.	N.A.	1	N.A.			1	N.A.
Picnic Tables	EA.	N.A.	400	N.A.			400	N.A.
Fireplaces	EA.	N.A.	240	N.A.			240	N.A.
Playground Equipment	L.S.	N.A.	1	N.A.			1	N.A.
Administration Bldg.	EA.	N.A.	1	N.A.			1	N.A.
Stairways	EA.	N.A.	5	N.A.			5	N.A.
*Comfort Stations	EA.	N.A.	3	N.A.	4	\$160,000	7	N.A.
Site Preparation	L.S.	9,000			1	9,000	1	9,000
Trailer Sewerage System	Sites	600			140	84,000	140	84,000
Park Benches	EA.	100			4	400	4	400

BOURNE SCENIC PARK (Con't)

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Trailer Dump Station	EA.	23,000	1		1	23,000	1	23,000
Park Entrance Building	EA.	12,000	1		1	12,000	1	12,000
Swimming Pool and Parking Improvements	L.S.	45,000	1		1	45,000	1	45,000
Sign	EA.	400	1		1	400	1	400
Interpretive Panels	EA.	1,500	4		4	6,000	4	6,000
Panel Shelter	EA.	3,000	1		1	3,000	1	3,000
Vista Clearing	L.S.	1,000	1		1	1,000	1	1,000
Sub-Total				N.A.		\$343,000		N.A.
Contingencies				0		68,200		
Construction Cost				N.A.		\$412,000		N.A.
E & D and S & A				0		82,000		
Total Cost				N.A.		\$494,000		N.A.
Federal Cost				\$90,000		\$247,000		\$337,000
Non-Federal Cost				N.A.		\$247,000		N.A.

* Two existing comfort stations will be replaced.

No costs are available for facilities provided by the Town of Bourne.

SCUSSET BEACH STATE PARK

ITEM	UNIT	UNIT COST	EXISTING		FUTURE		TOTAL	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Paved Roads	MI.	N.A.	2.3	N.A.			2.3	N.A.
Parking Area (Tar)	S.Y.	N.A.	50,000	N.A.			50,000	N.A.
Parking Area (Asphalt)	S.Y.	N.A.	11,000	N.A.			11,000	N.A.
Fireplaces	EA.	N.A.	15	N.A.			15	N.A.
Water Supply	L.S.	N.A.	2	N.A.			2	N.A.
Electricity	L.S.	N.A.	1	N.A.			1	N.A.
Bathhouse	EA.	N.A.	1	N.A.			1	N.A.
(Concession Stand	EA.	N.A.	1	N.A.			1	N.A.
Administration Bldg.	EA.	N.A.	1	N.A.			1	N.A.
Picnic Tables	EA.	N.A.	60	N.A.			60	N.A.
Fishing Pier	EA.	N.A.	1	N.A.			1	N.A.
Interpretive Panels	EA.	1,500			3	4,500	3	4,500
Landscaping	ACRFS	3,000			8	24,000	8	24,000
*Campground	SITES	13,017	100	134,700			100	1,301,700

* The Commonwealth of Massachusetts and the Bureau of Outdoor Recreation cost-shared the entire camping complex.

SCUSSET BEACH STATE PARK (Con't)

ITEM	UNIT	UNIT		EXISTING		FUTURE		TOTAL	
		UNIT	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
Sub-Total					N.A.		\$28,500	N.A.	N.A.
Contingencies					0		5,500		5,500
Construction Cost					N.A.		\$34,000	N.A.	N.A.
E & D and S & A					0		7,000		7,000
Total Cost					N.A.		\$41,000		N.A.
Federal Cost					0		\$41,000		\$41,000
Non-Federal Cost					N.A.		0		N.A.

No costs are available for facilities provided by the Commonwealth of Massachusetts.

XV. CONCLUSIONS

The Cape Cod Canal, originally constructed solely as an aid to coastal navigation, has evolved through the years into a major focal point for several outdoor recreational pursuits. In each of the past several years over a million visitors have participated in some form of outdoor recreation activity ranging from sightseeing to fishing on Canal associated government lands. These visits are occurring at sites and locations which were designed for much smaller numbers of visitors or at sites which have a minimum of facilities available to the public.

The response to this pressure in the past, for reasons which were valid at the time, i.e. lack of budgeted funds for recreational development, was a fragmentary and piecemeal approach at individual sites without the benefit of a comprehensive look at the recreation resources of the whole Canal complex. One of the major objectives of this Master Plan was to place in one document all that is presently known about these resources, and to draw from this information a coordinated management and development plan. We feel that this goal has been reached.

The Cape Cod Canal is where the Corps of Engineers and its works receives its maximum exposure to the public in New England. The Canal then provides a magnificent opportunity for the Corps to demonstrate, by implementing the recommendations of this Master Plan, a concern for the natural environment under its stewardship. By the provision of facilities and visitor information services coupled

EXHIBIT A

AD-A099 242

CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV
CAPE CODE CANAL, MASSACHUSETTS DESIGN MEMORANDUM, MASTER PLAN F--ETC(U)
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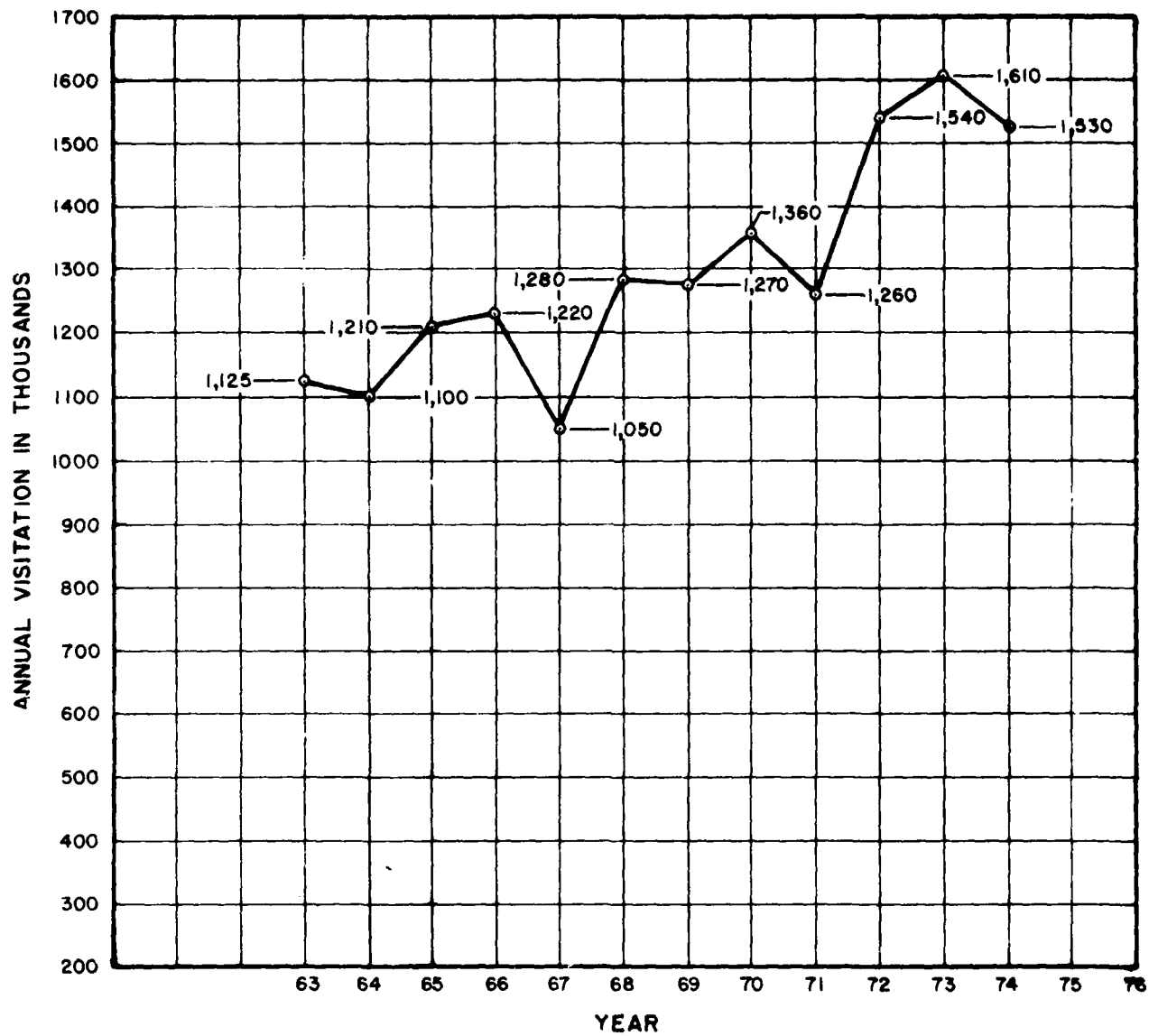
2 of 2

AD-A
099-242

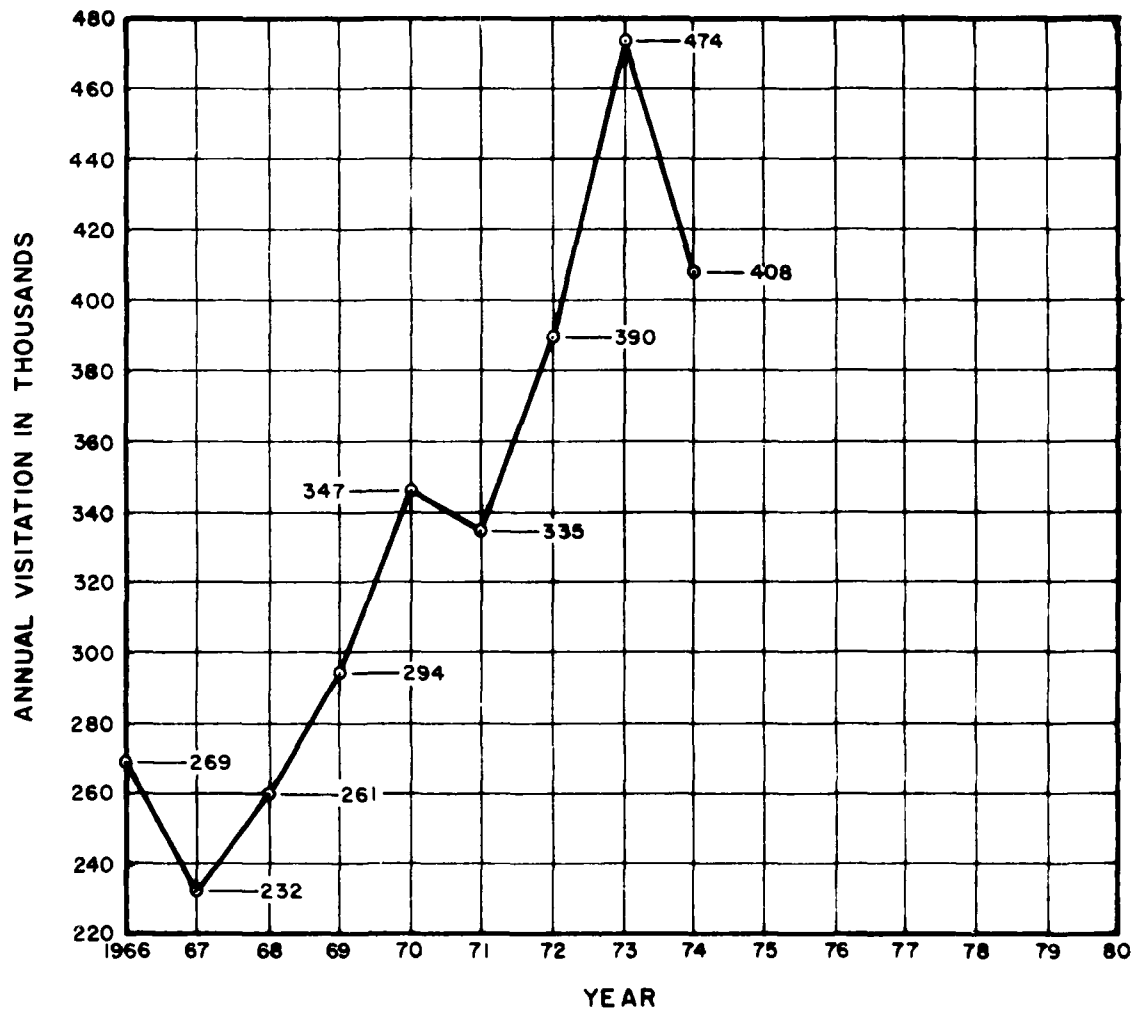


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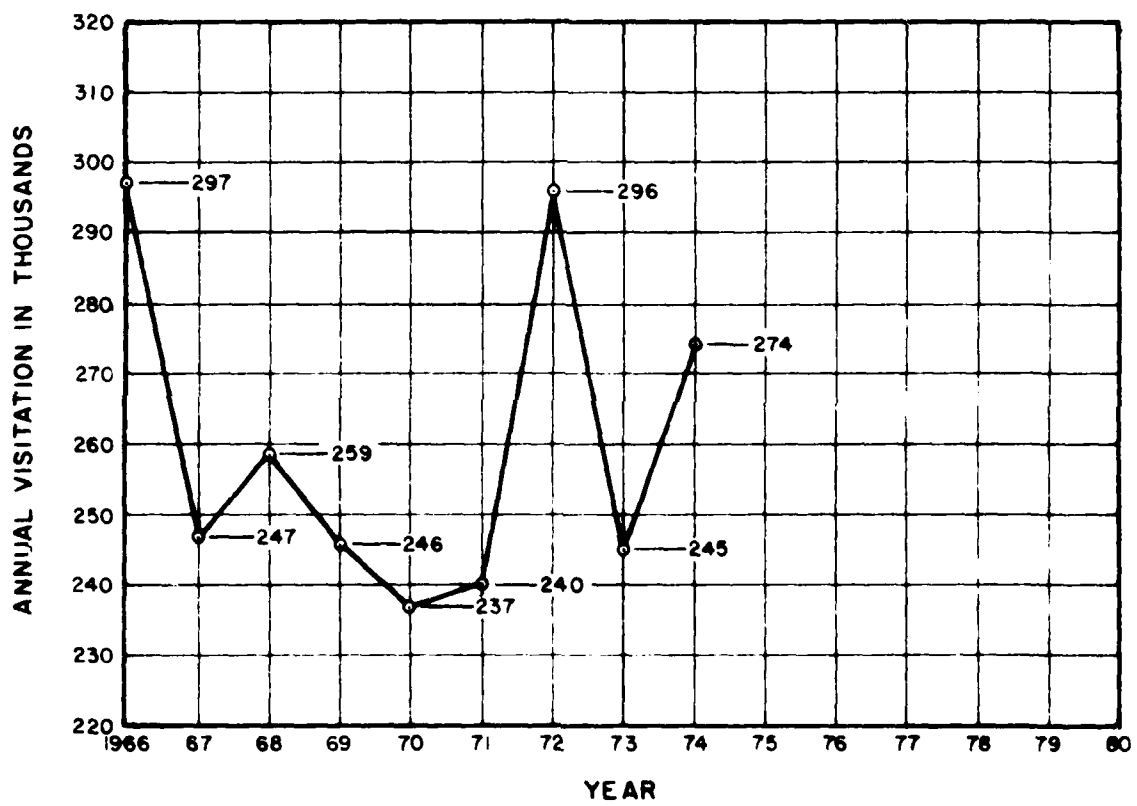
ALL CAPE COD CANAL RECREATION AREAS



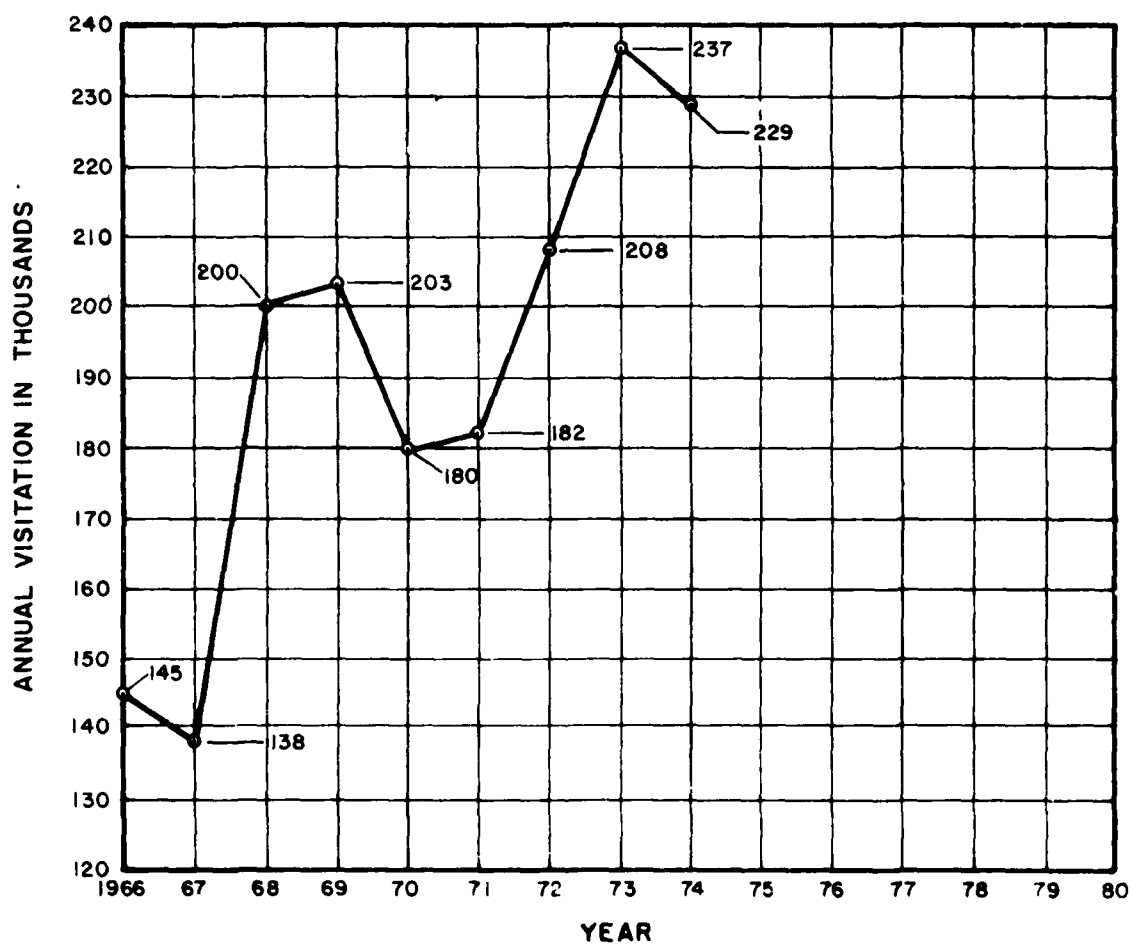
THE HERRING RUN



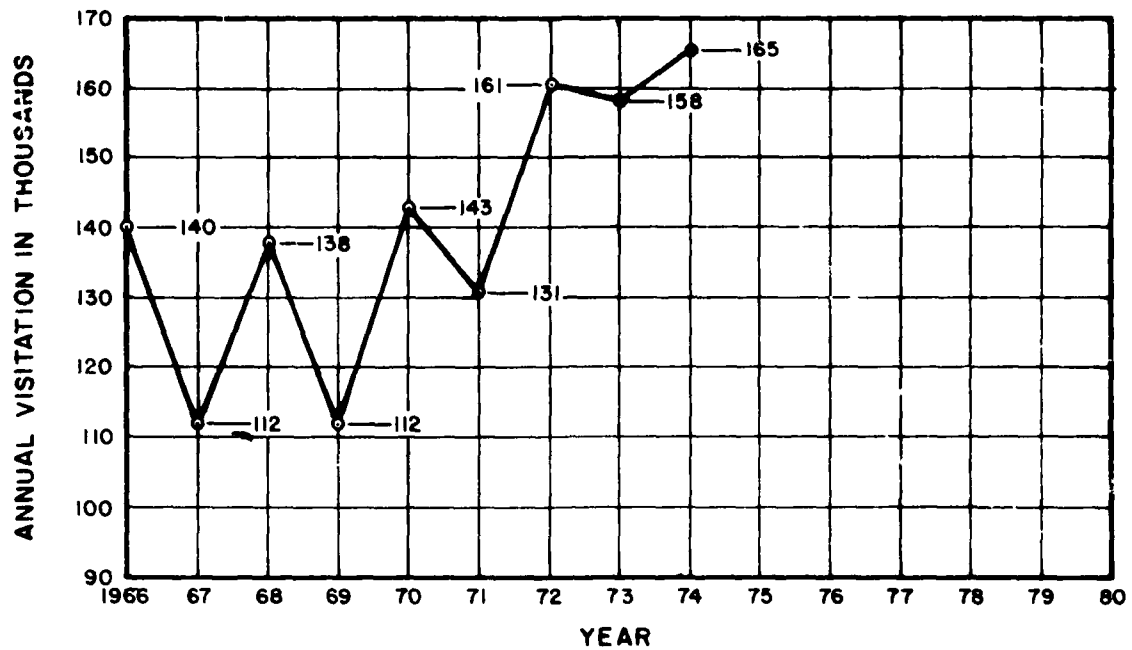
THE EAST BOAT BASIN



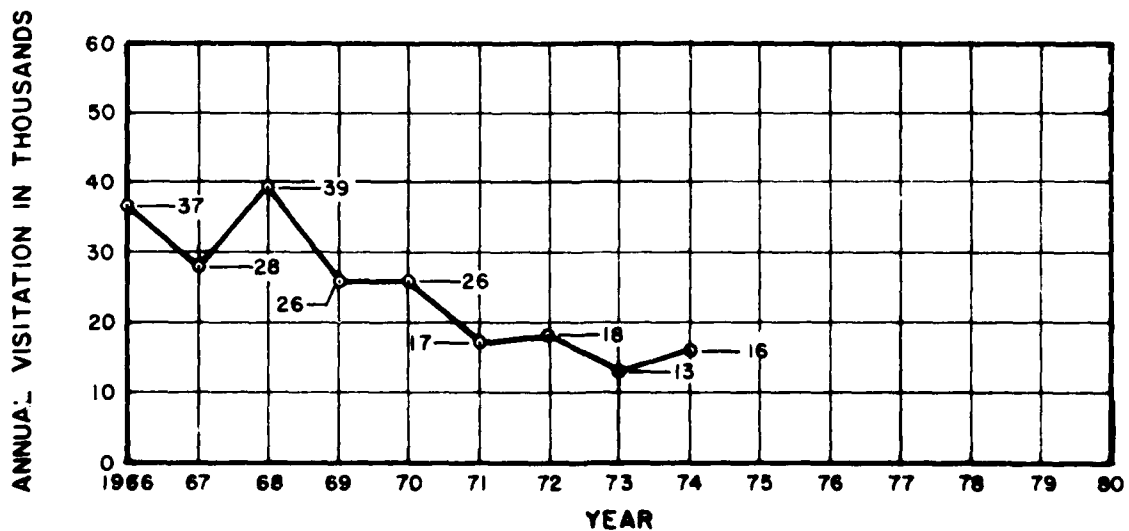
BOURNE SCENIC PARK



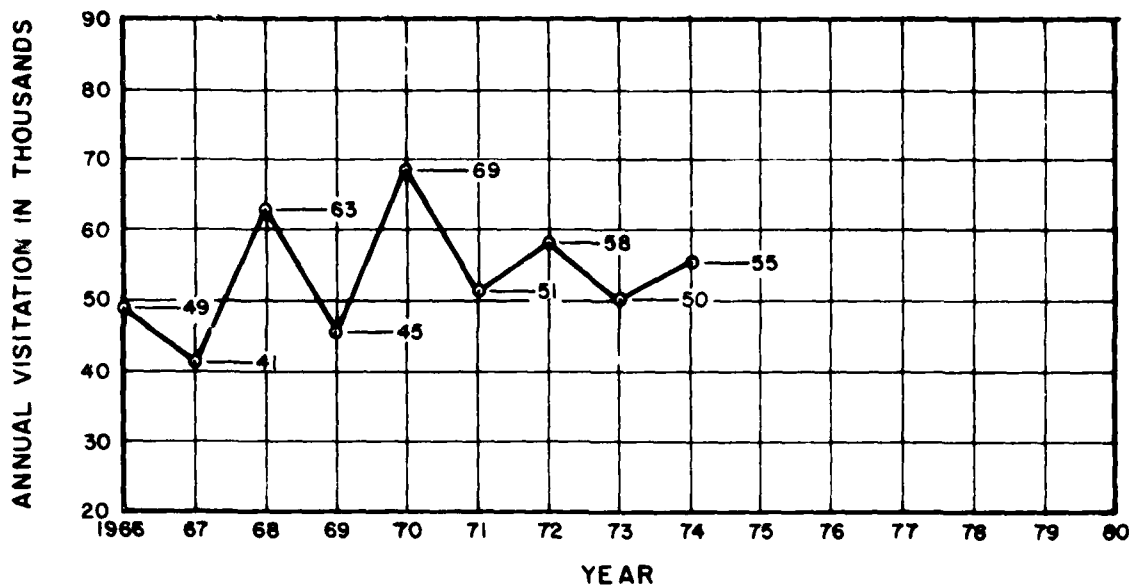
SCUSSET BEACH STATE PARK



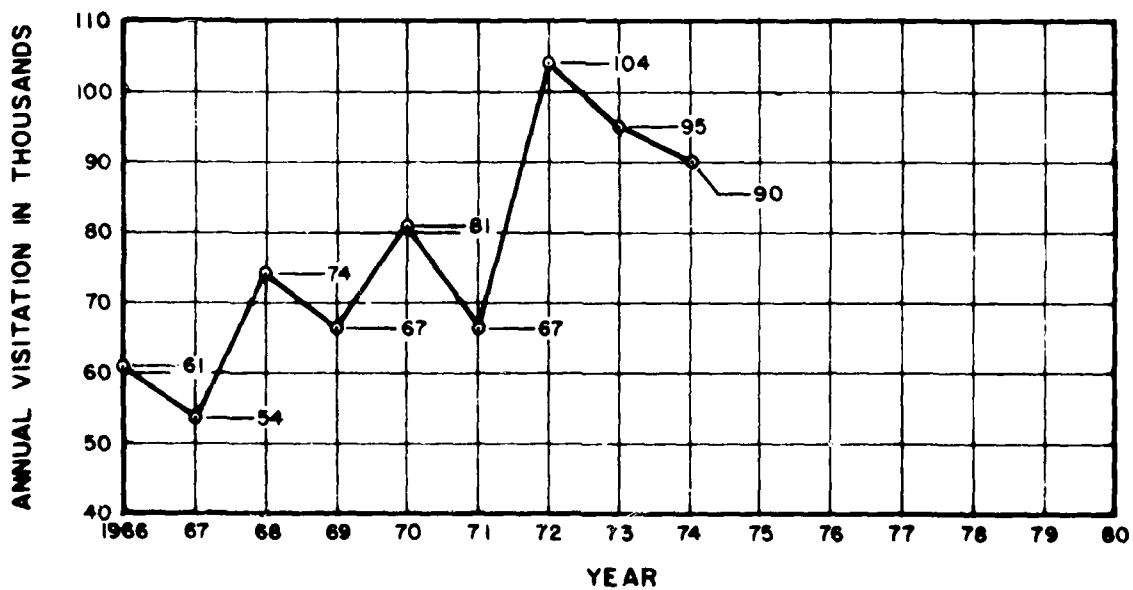
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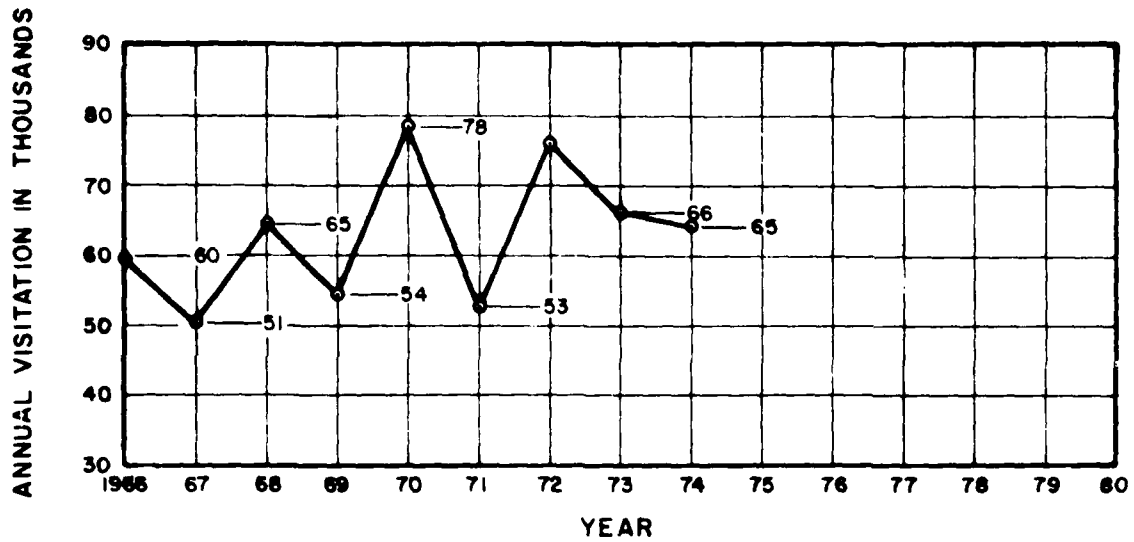
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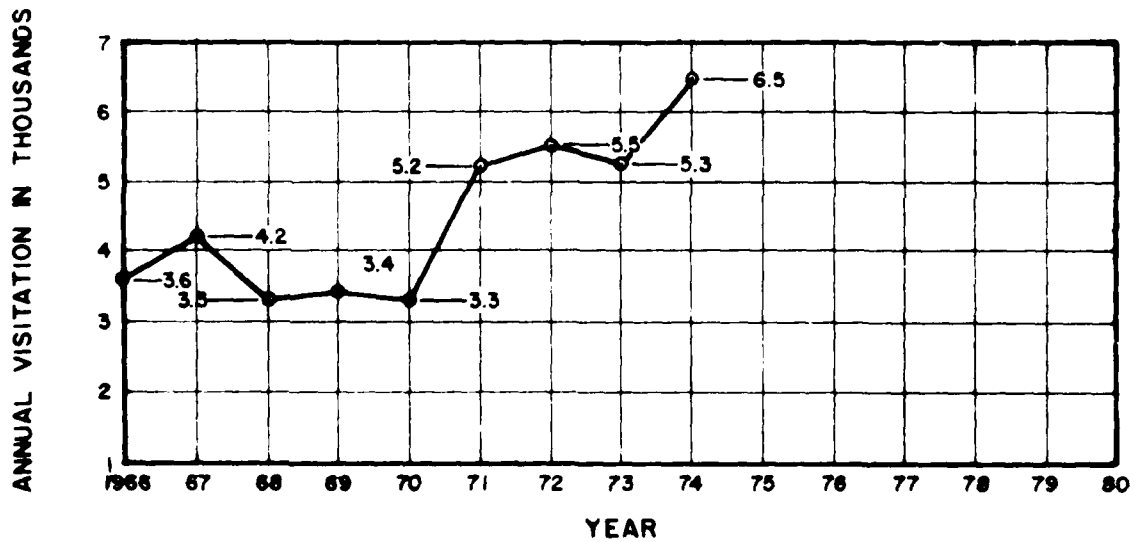
RAILROAD BRIDGE SOUTH



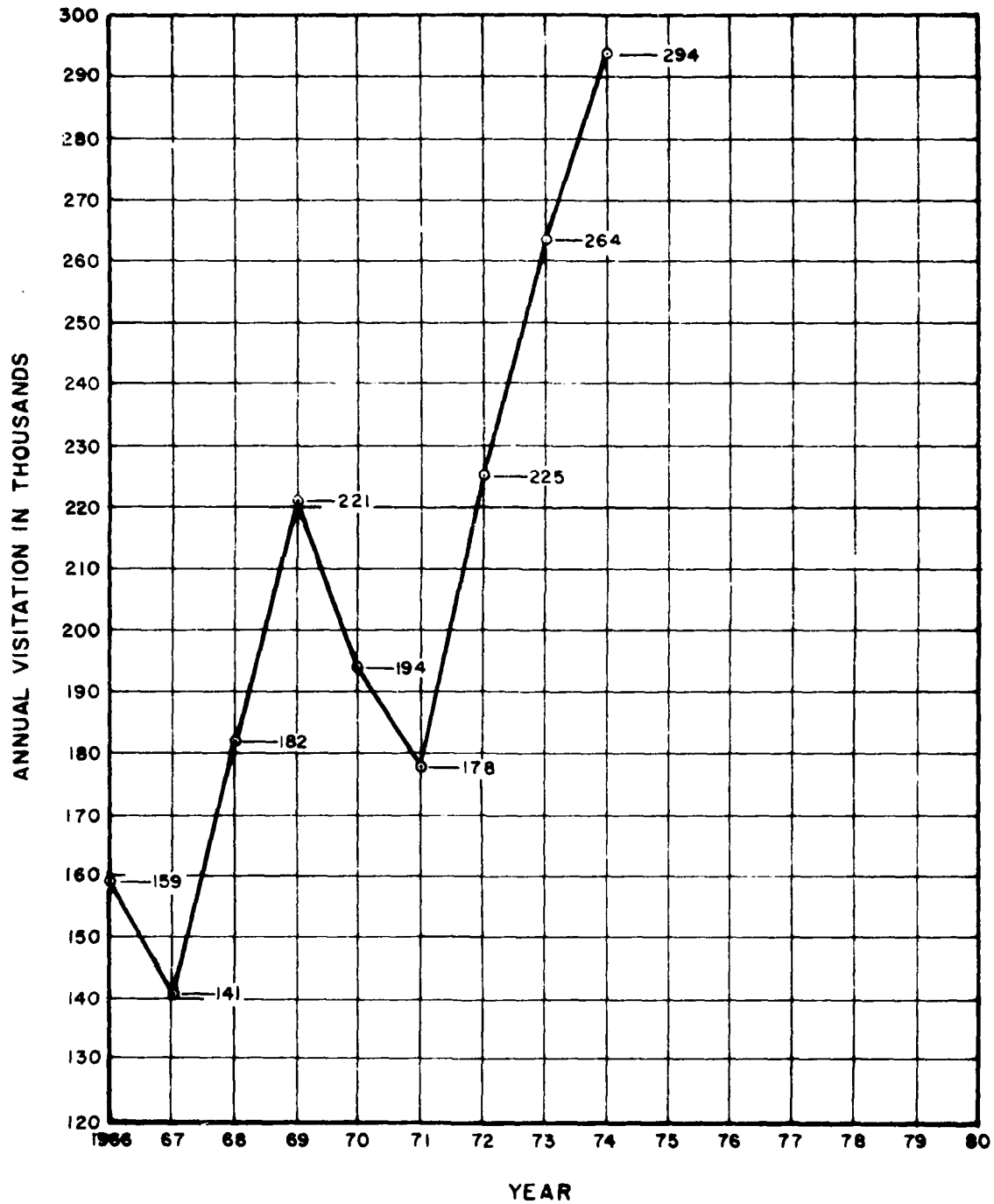
SAGAMORE EAST



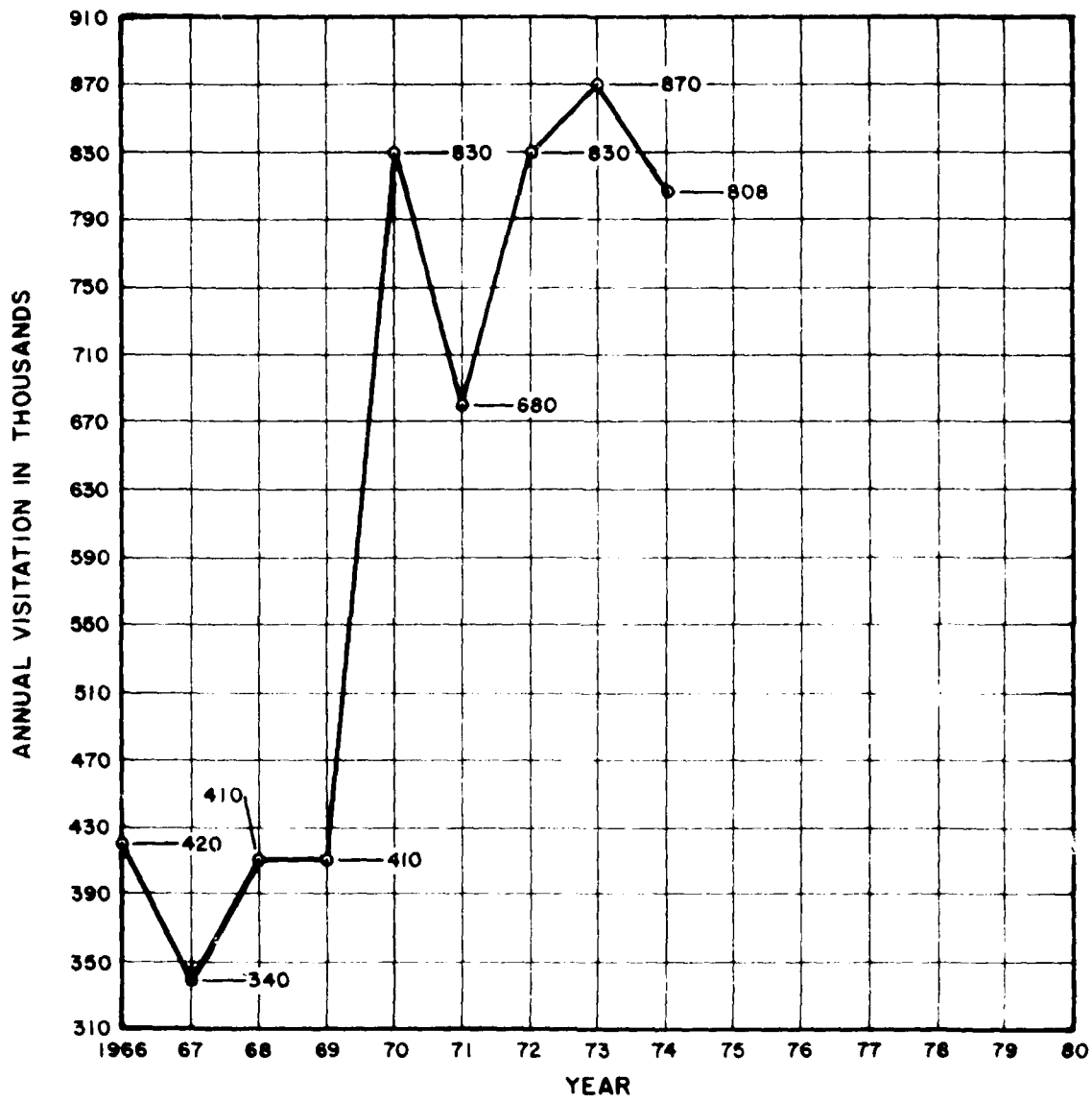
ADMINISTRATION AREA



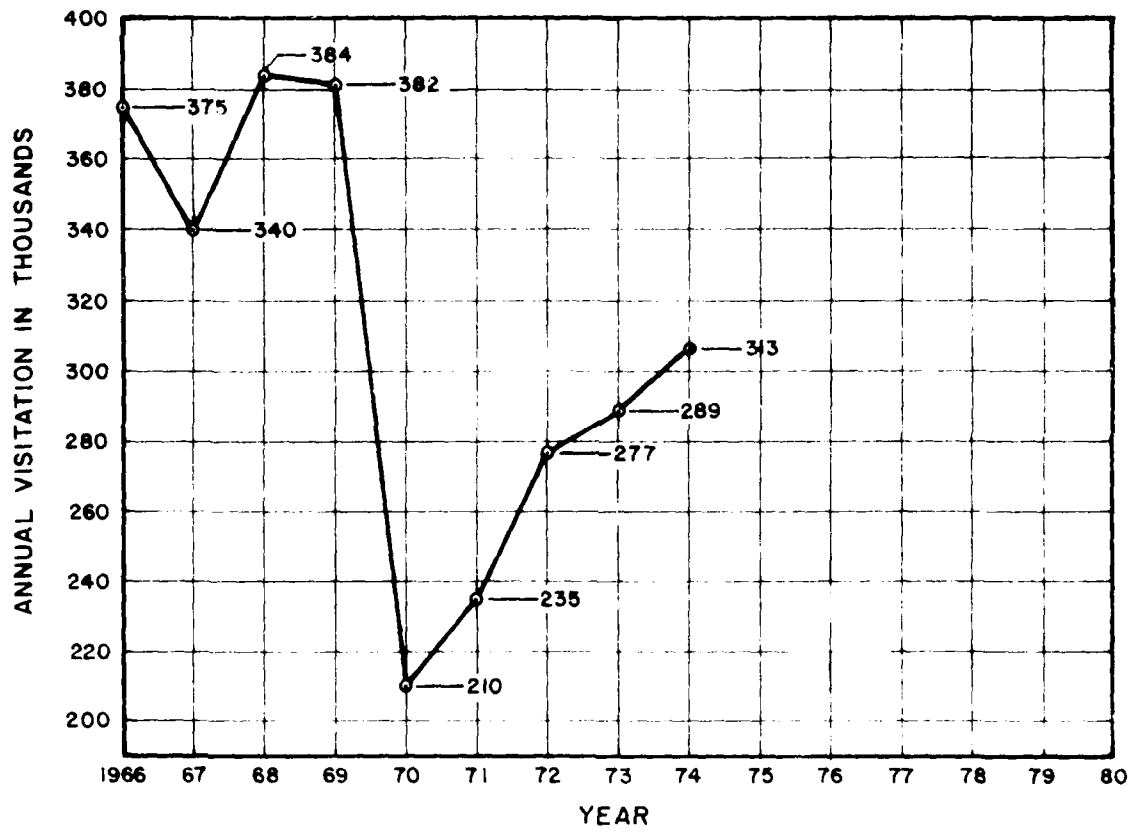
OTHER MISCELLANEOUS AREAS



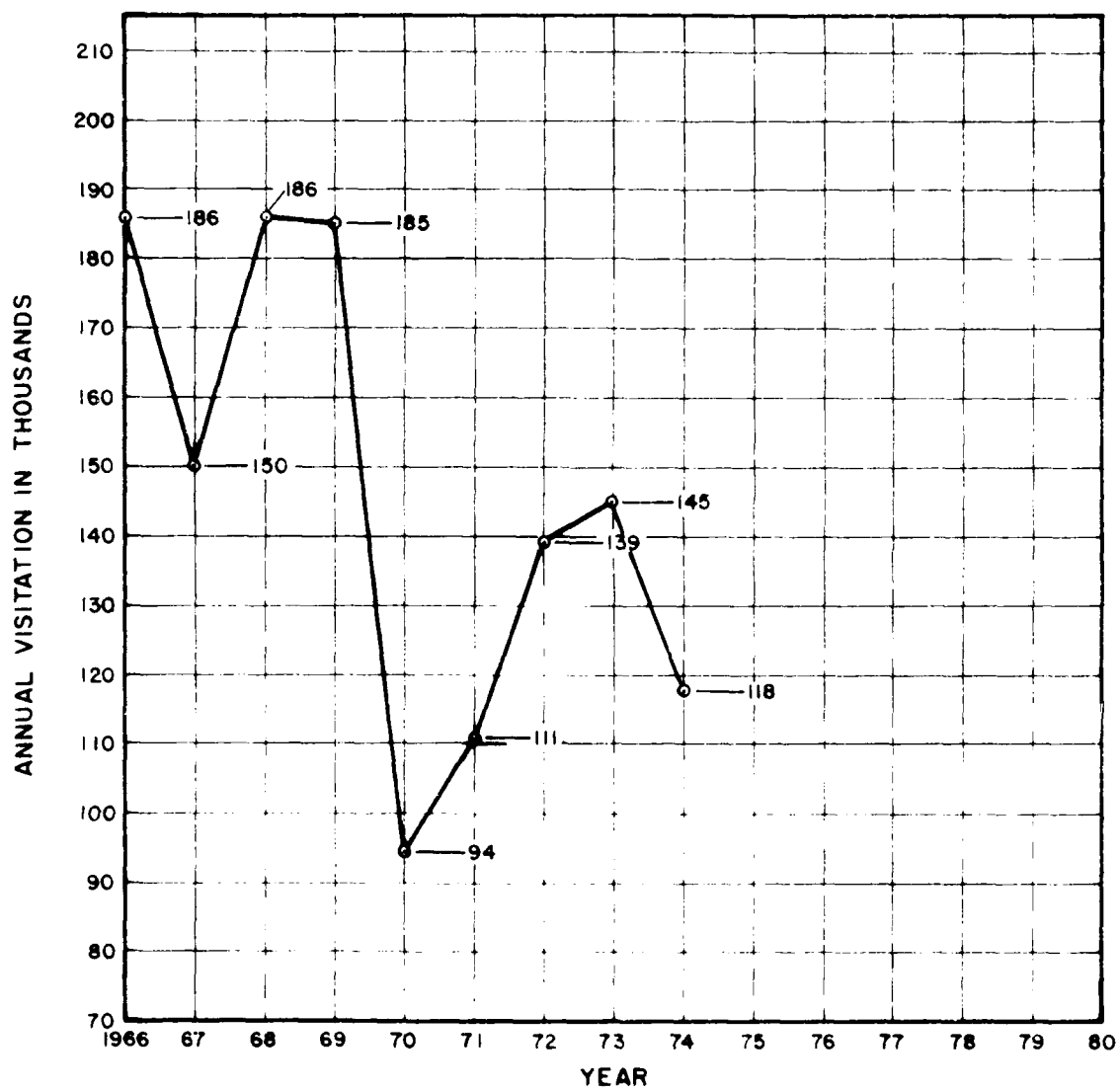
SIGHTSEEING



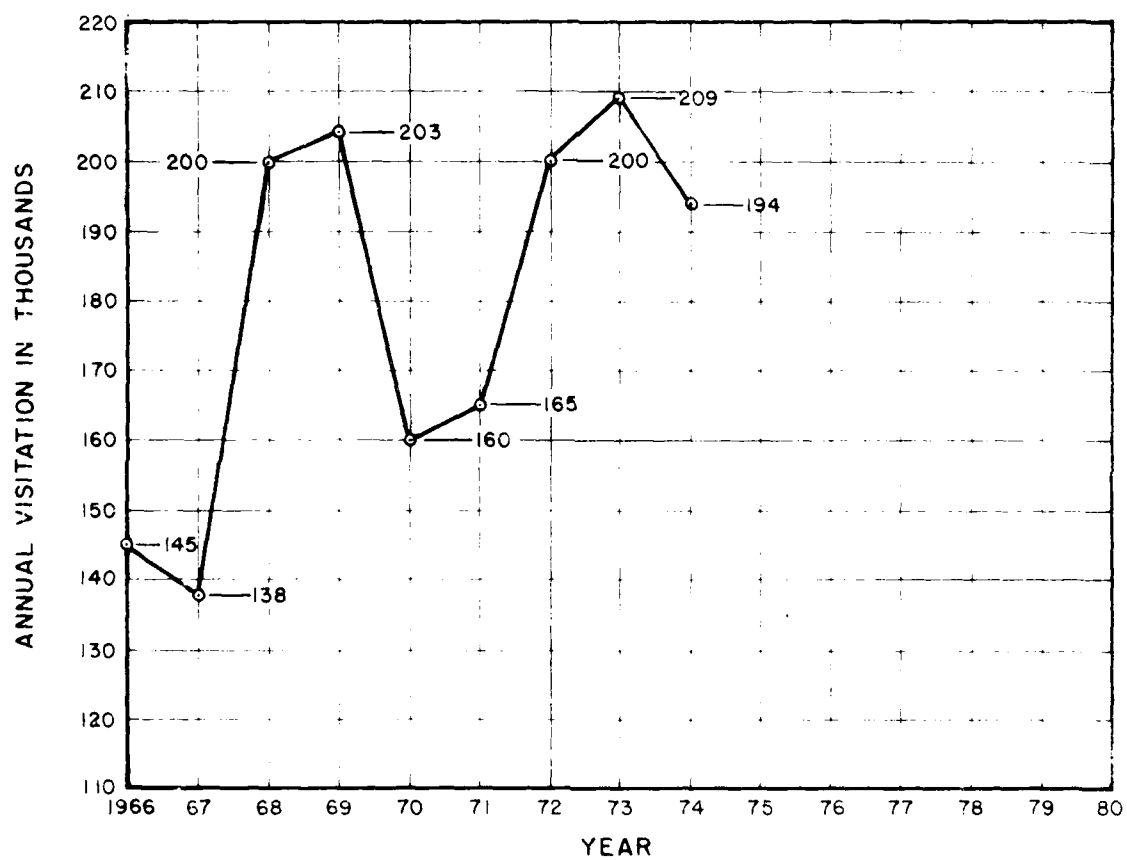
FISHING



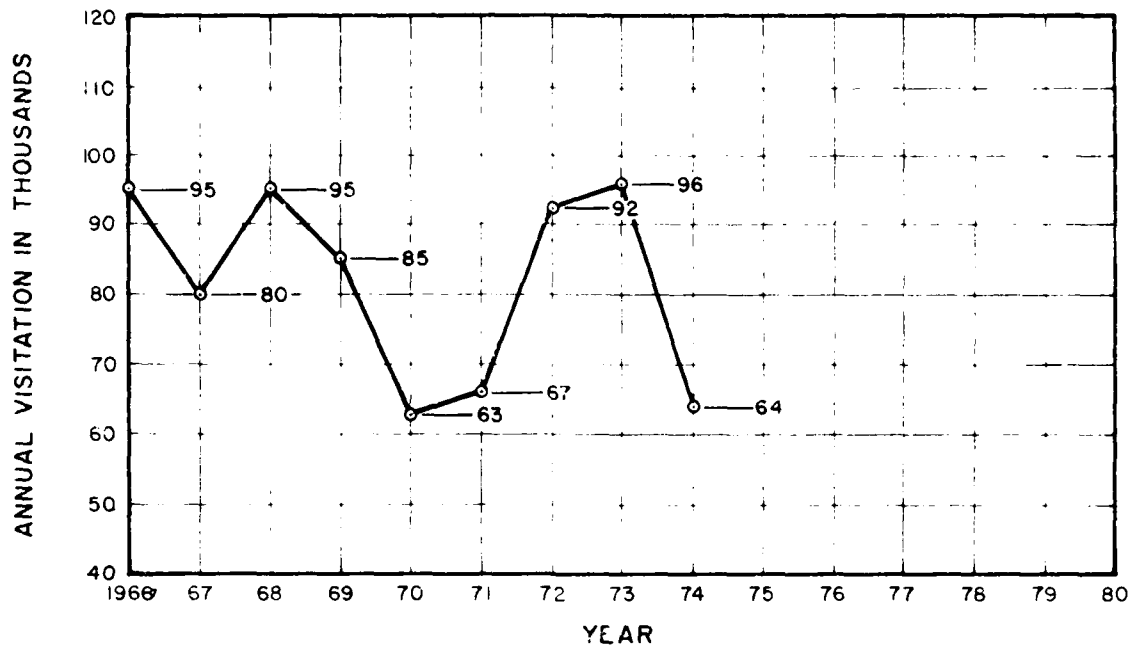
PICNICKING



CAMPING



SWIMMING



PHEASANT HUNTING AT SCUSSET BEACH

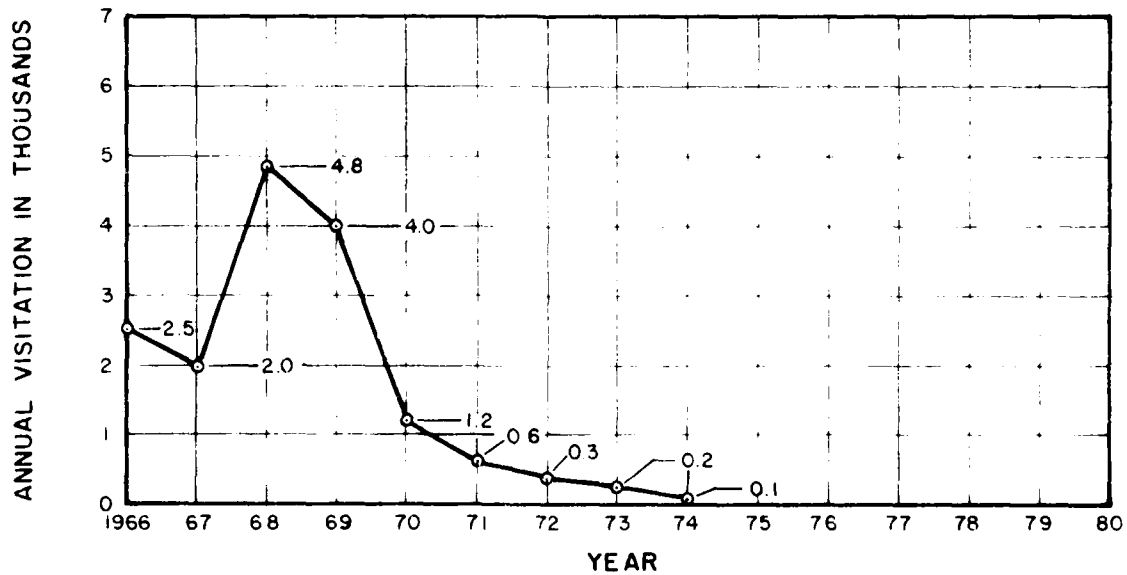
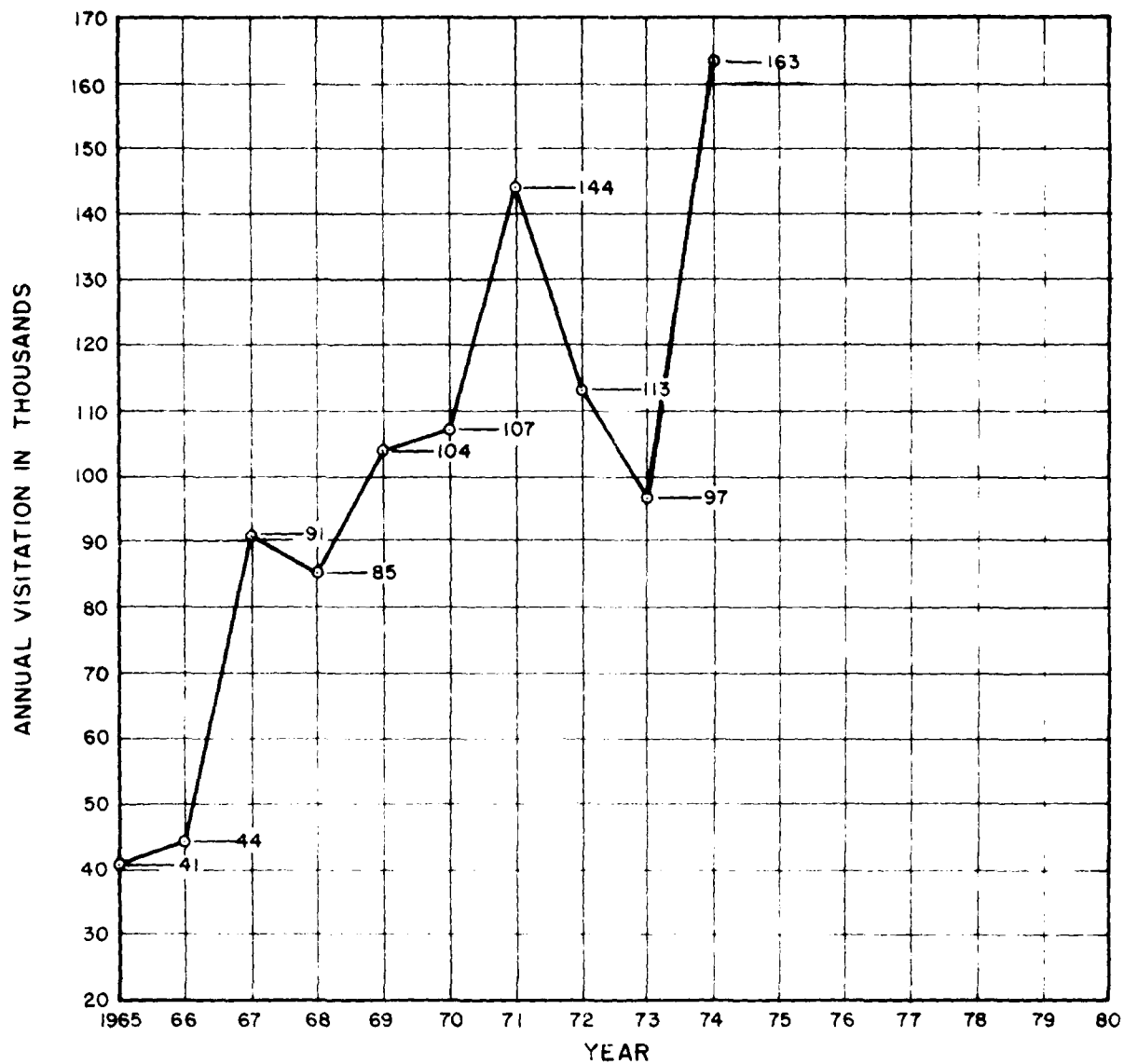


EXHIBIT B

OVERNIGHT VISITS AT SHAWME-CROWELL STATE FOREST ON CAPE COD



OVERNIGHT VISITS AT NICKERSON STATE PARK ON CAPE COD

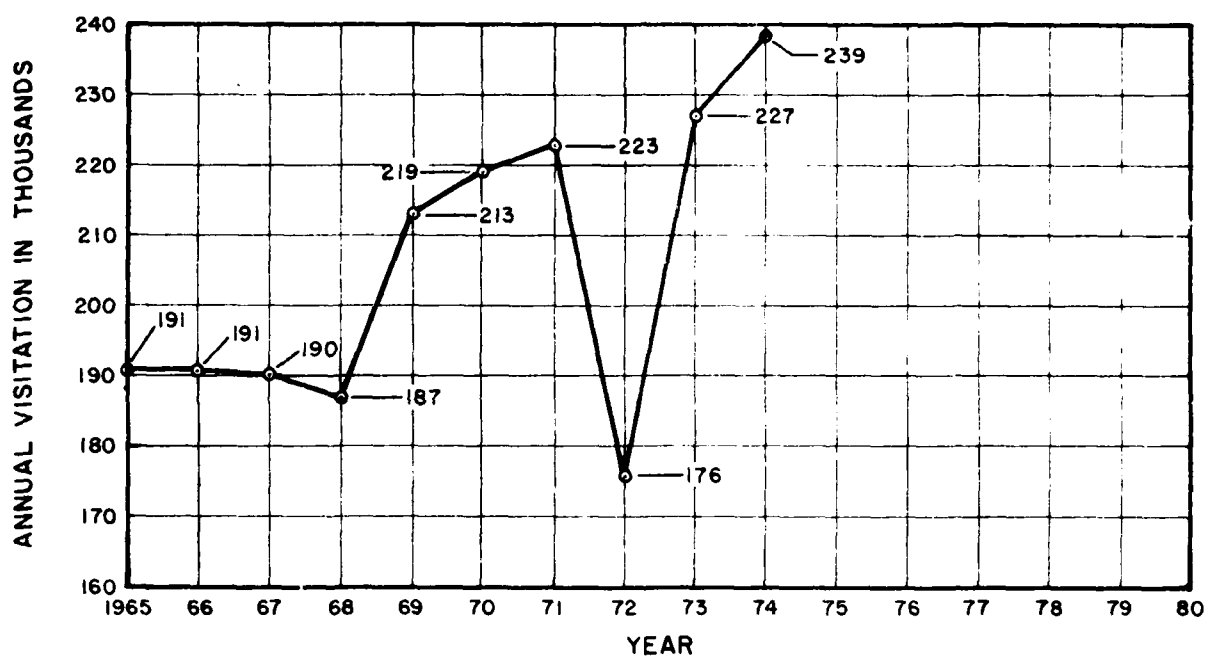
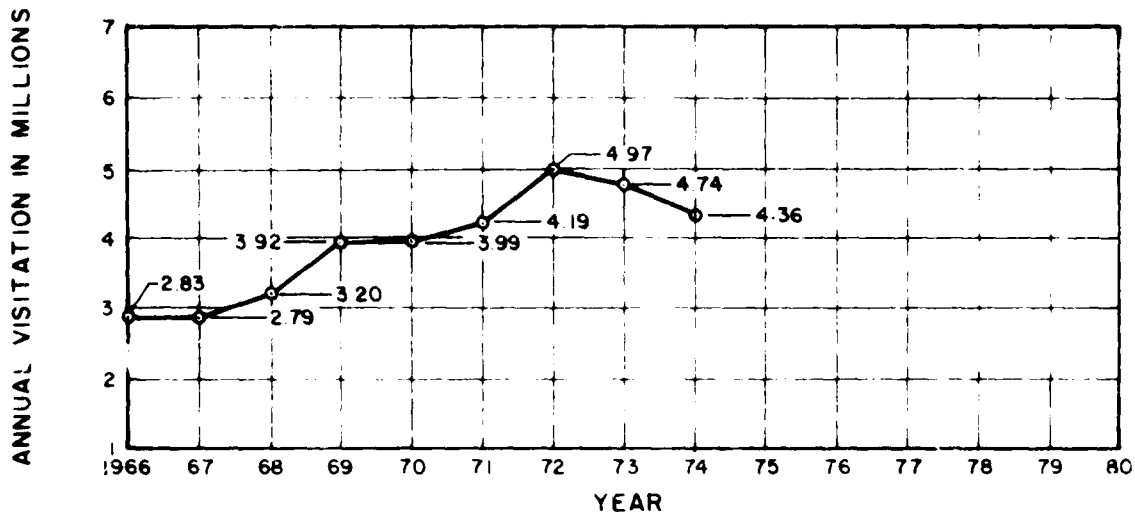
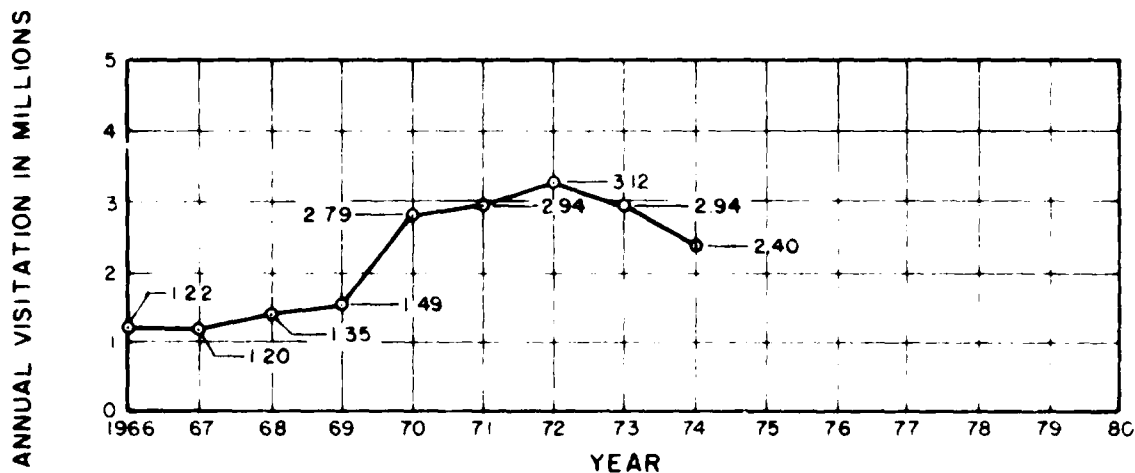


EXHIBIT C

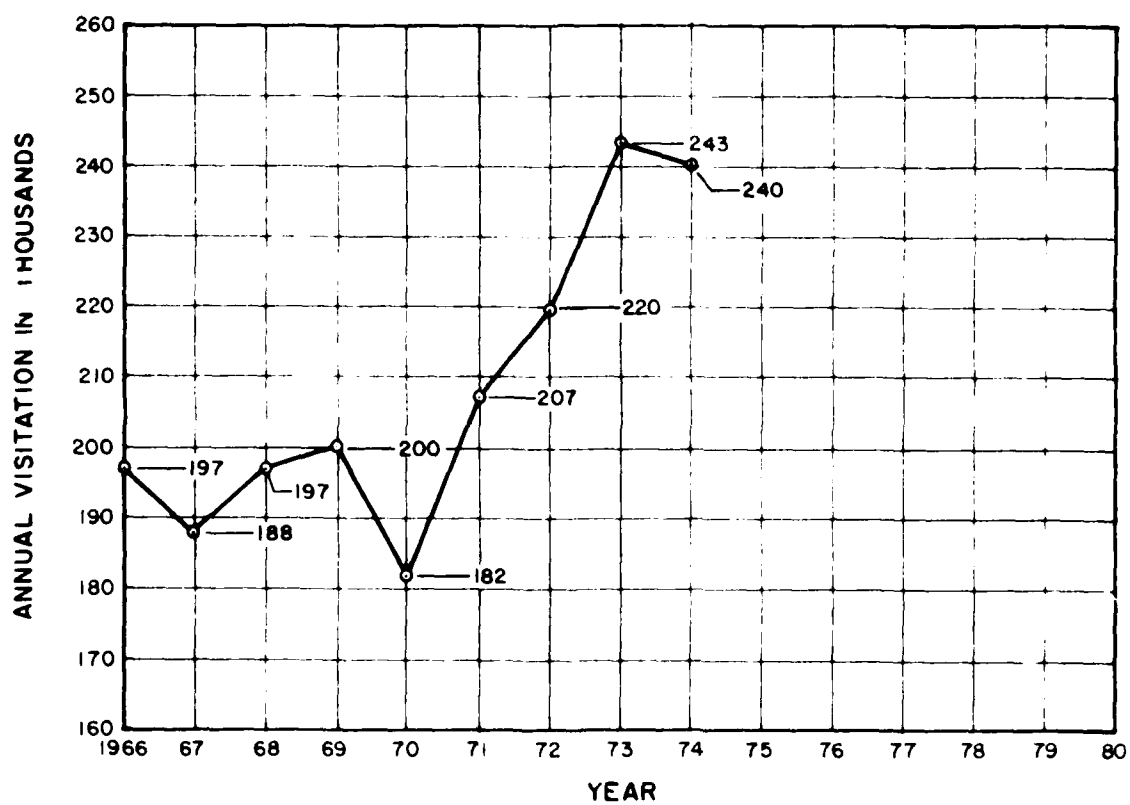
TOTAL VISITATION AT MAJOR ACCESS AND USE AREAS WITHIN THE CAPE COD NATIONAL SEASHORE

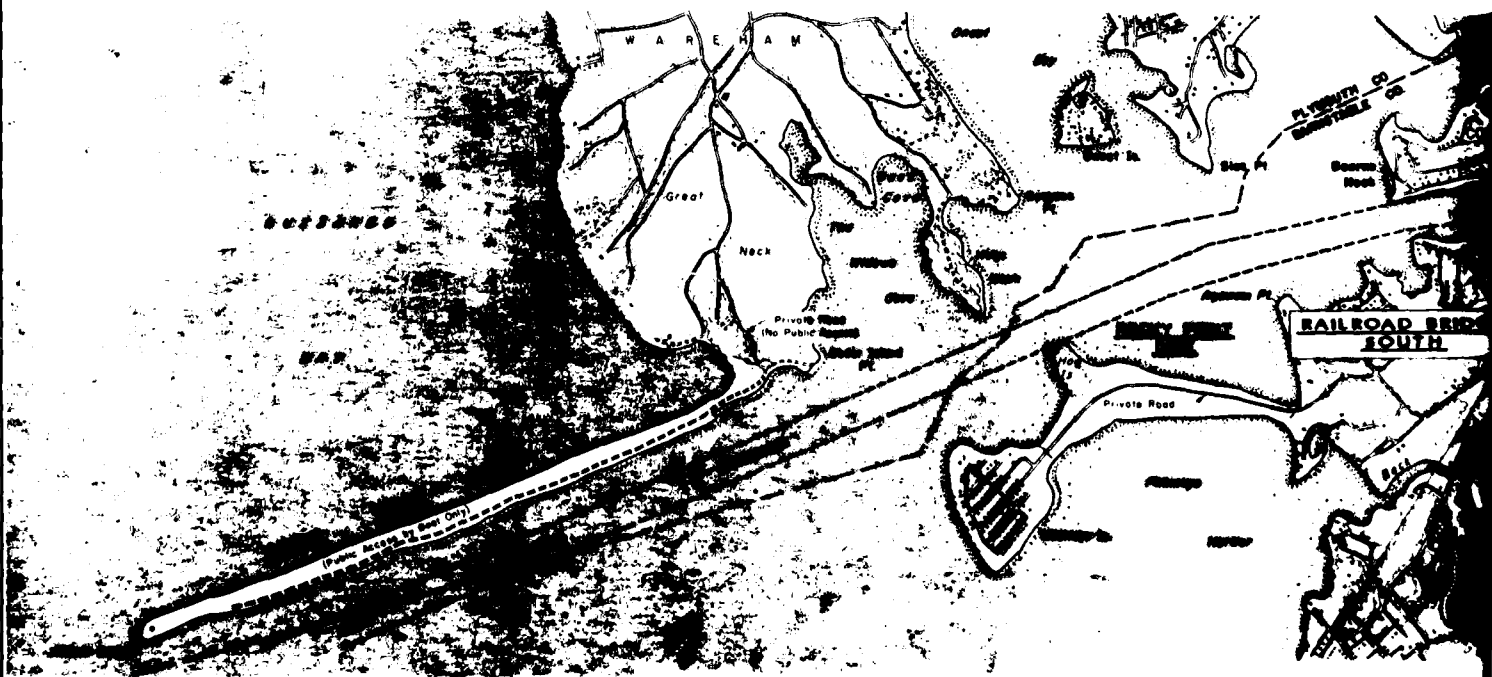
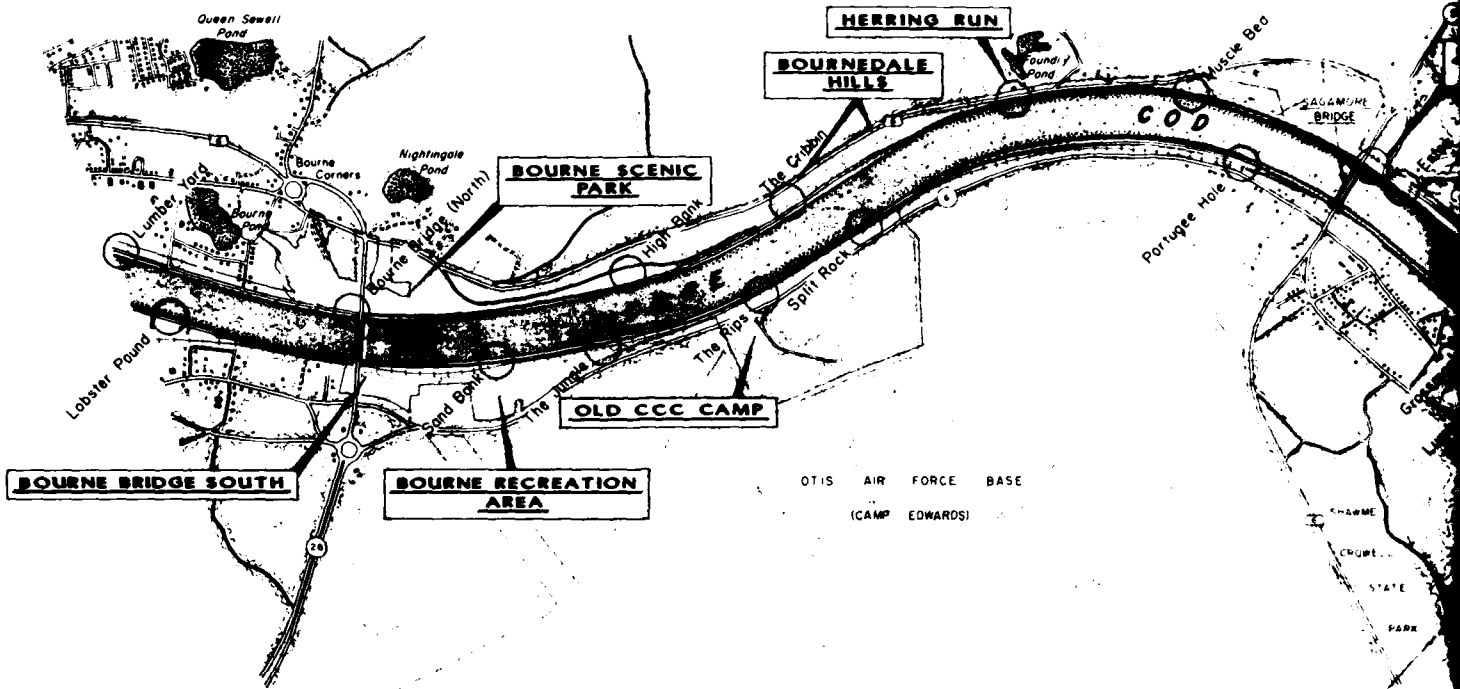


VISITATION AT PROTECTED BEACHES WITHIN THE CAPE COD NATIONAL SEASHORE

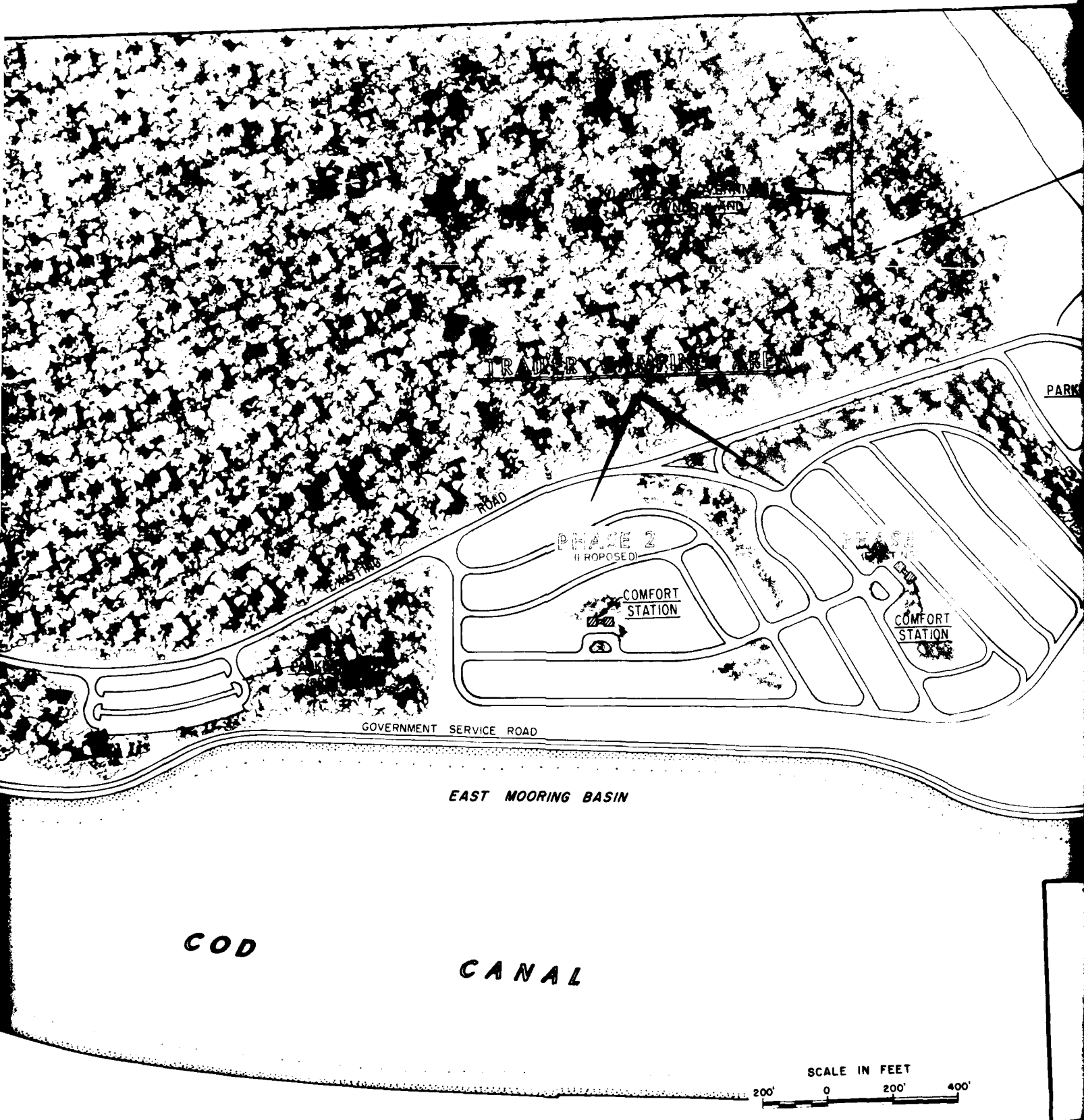


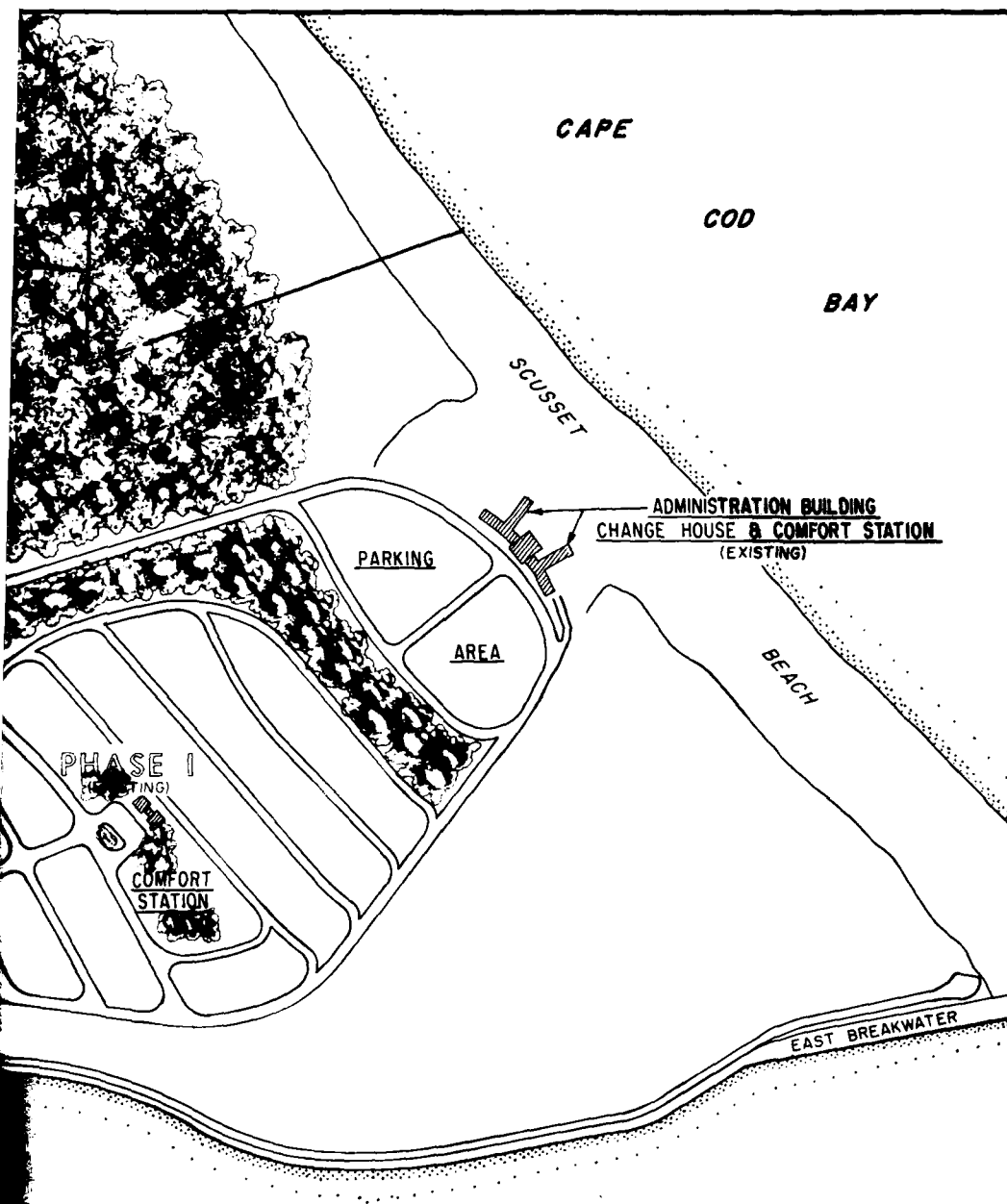
VISITATION AT CAMPGROUNDS WITHIN THE CAPE COD NATIONAL SEASHORE







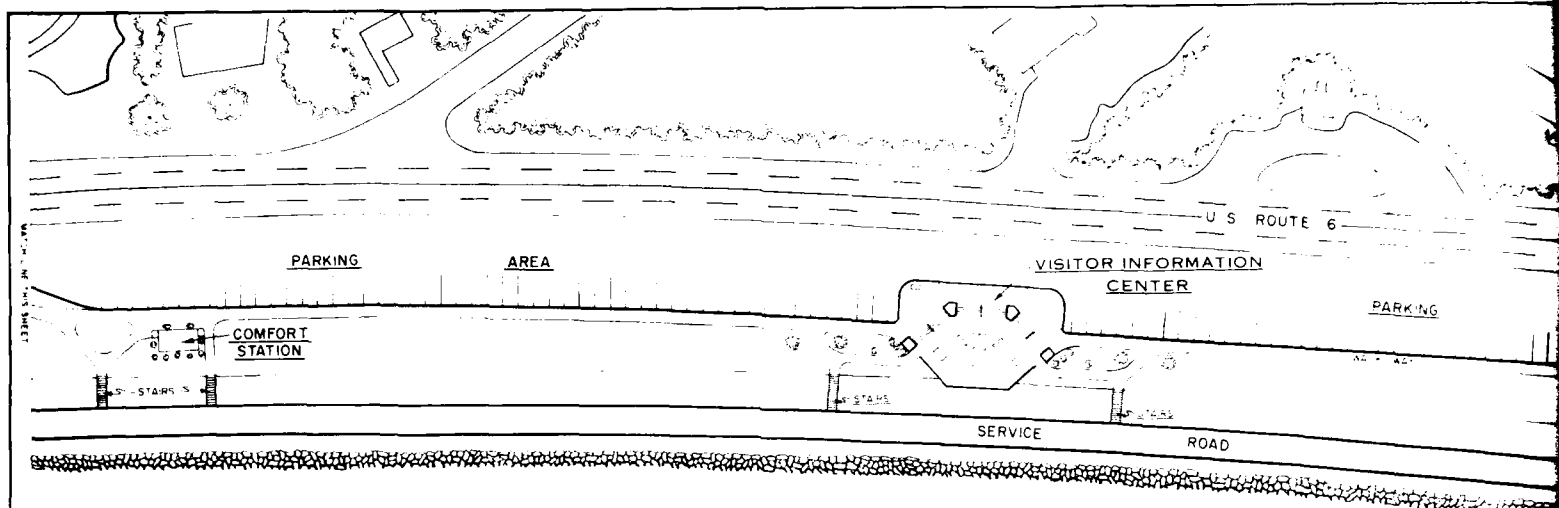




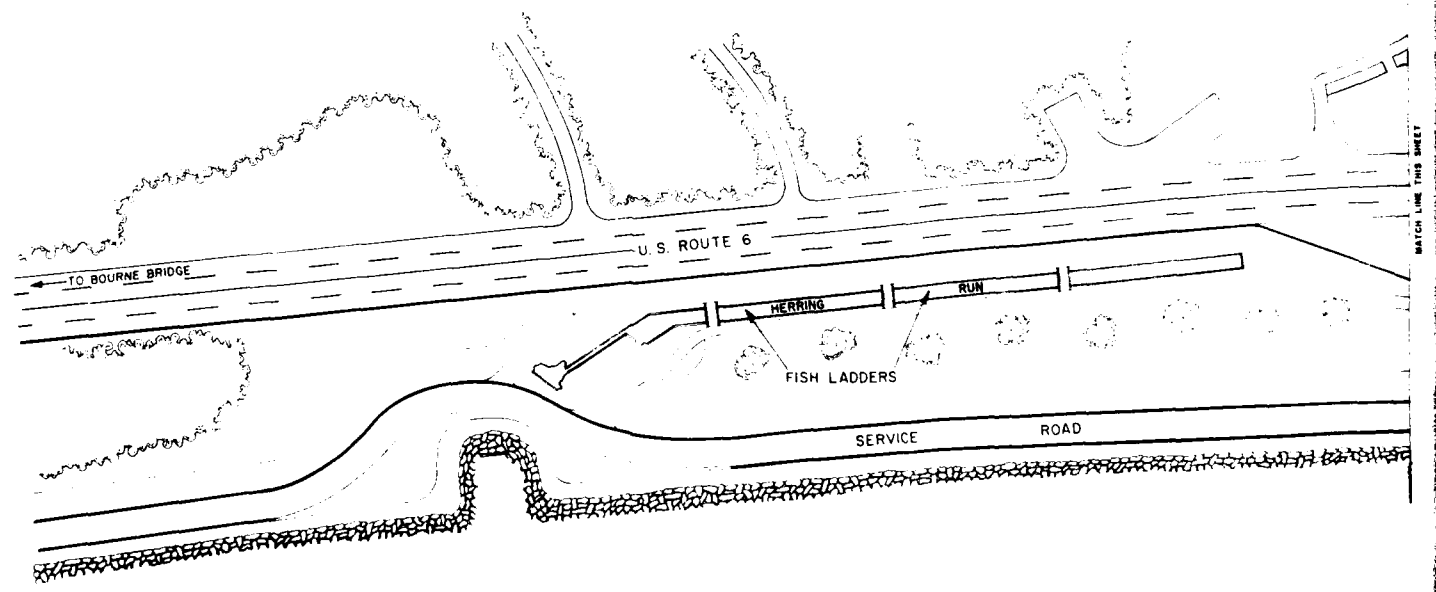
CAPE COD CANAL
MASTER PLAN
SCUSSET BEACH STATE PARK

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. OCTOBER 1975
SCALE AS SHOWN

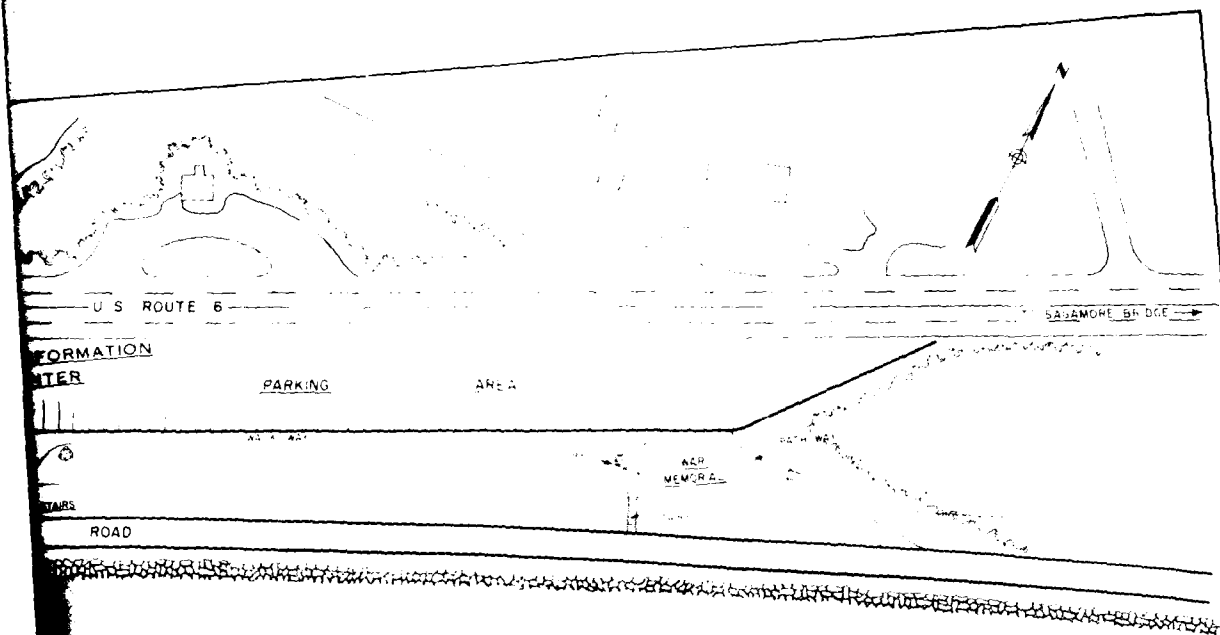
PLATE NO. 2



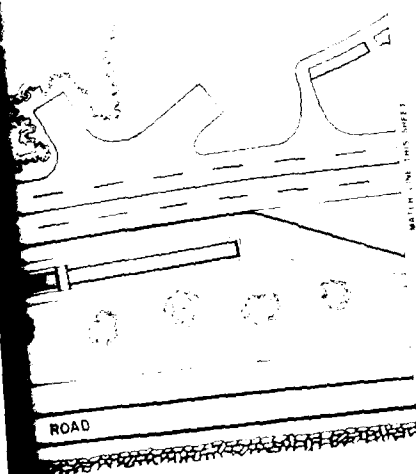
CAPE COD CANAL



CAPE COD CANAL



CANAL

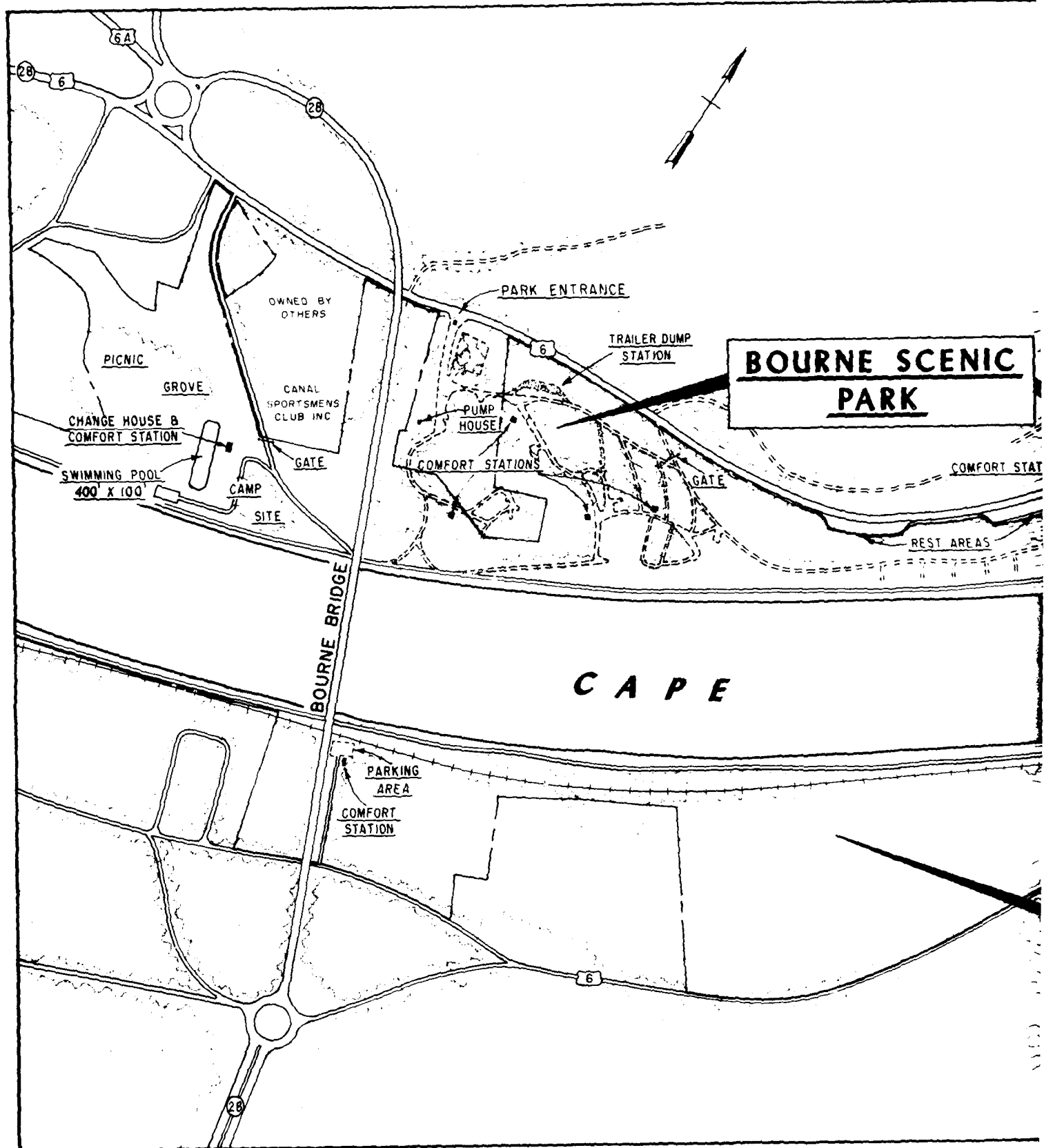


CAPE COD CANAL
MASTER PLAN
THE HERRING RUN

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. OCTOBER 1975
OFFICE AT CHILMARK

SCALE IN FEET
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PLATE NO. 3



**BOURNEDAL
HILLS**

**SCENIC
K**

REST AREA

REST AREA

COMFORT STATION

REST AREAS

CANAL

COD

GOV'T SERVICE ROAD

WOODED AREA AND
PICNIC GROVE WITH PARKING

OLD CCC CAMP

COMFORT
STATION

**BOURNE RECREATION
AREA**

LIMIT OF GOVERNMENT
OWNED LAND

THIS PORTION OF BORROW AREA
FOR CANAL MAINTENANCE

B/
FER

BOU



**BOURNEDALE
HILLS**

REST AREA

GOV'T SERVICE ROAD

REST AREA

CANAL

6

WOODED AREA AND
PICNIC GROVE WITH PARKING

BORROW AREA - TO BE GRADED,
FERTILIZED, SEEDED & REFORESTED

THIS PORTION OF BORROW AREA
FOR CANAL MAINTENANCE

**CAPE COD CANAL
MASTER PLAN
BOURNE DEVELOPMENT AREAS**

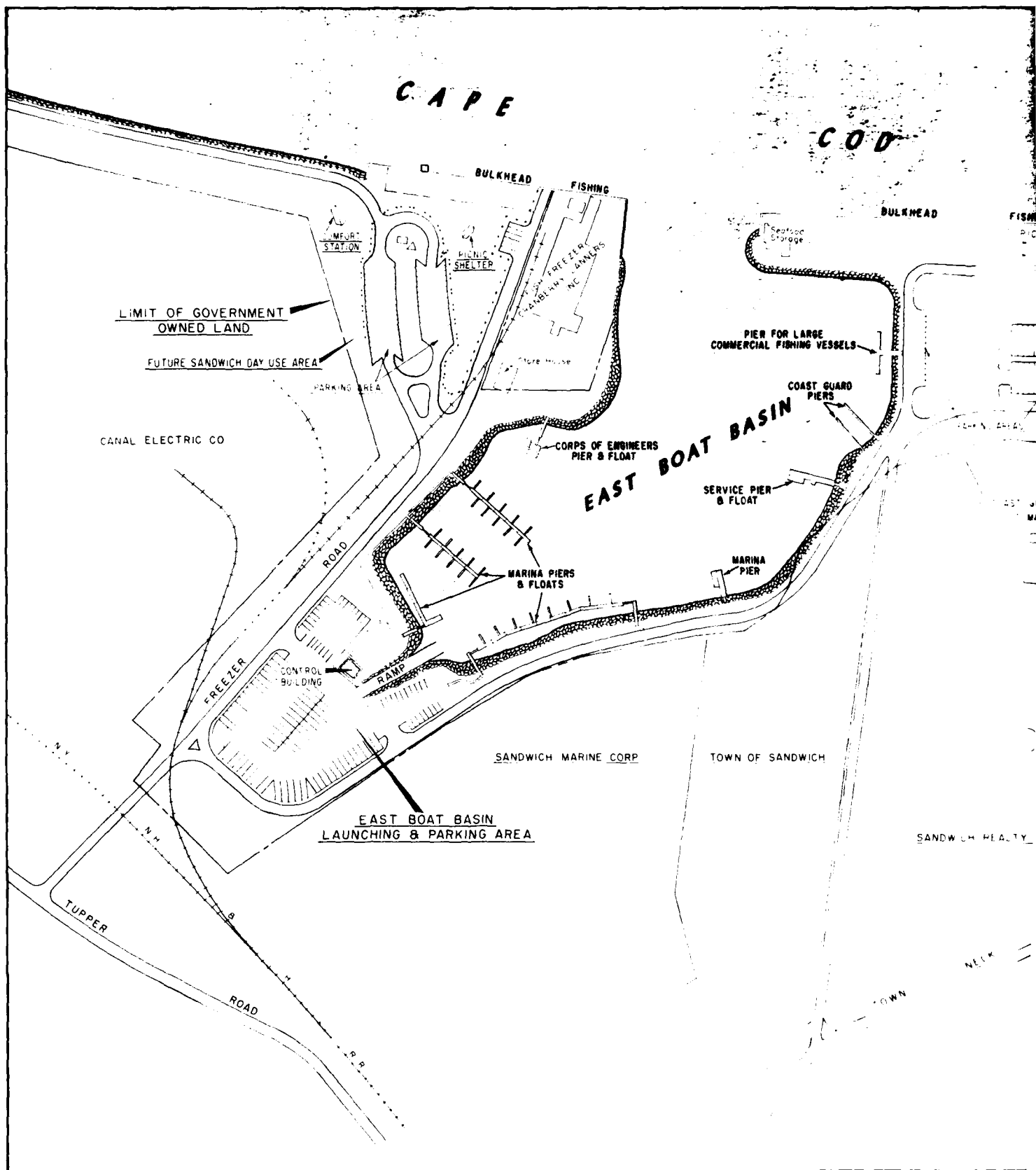
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS OCTOBER 1975

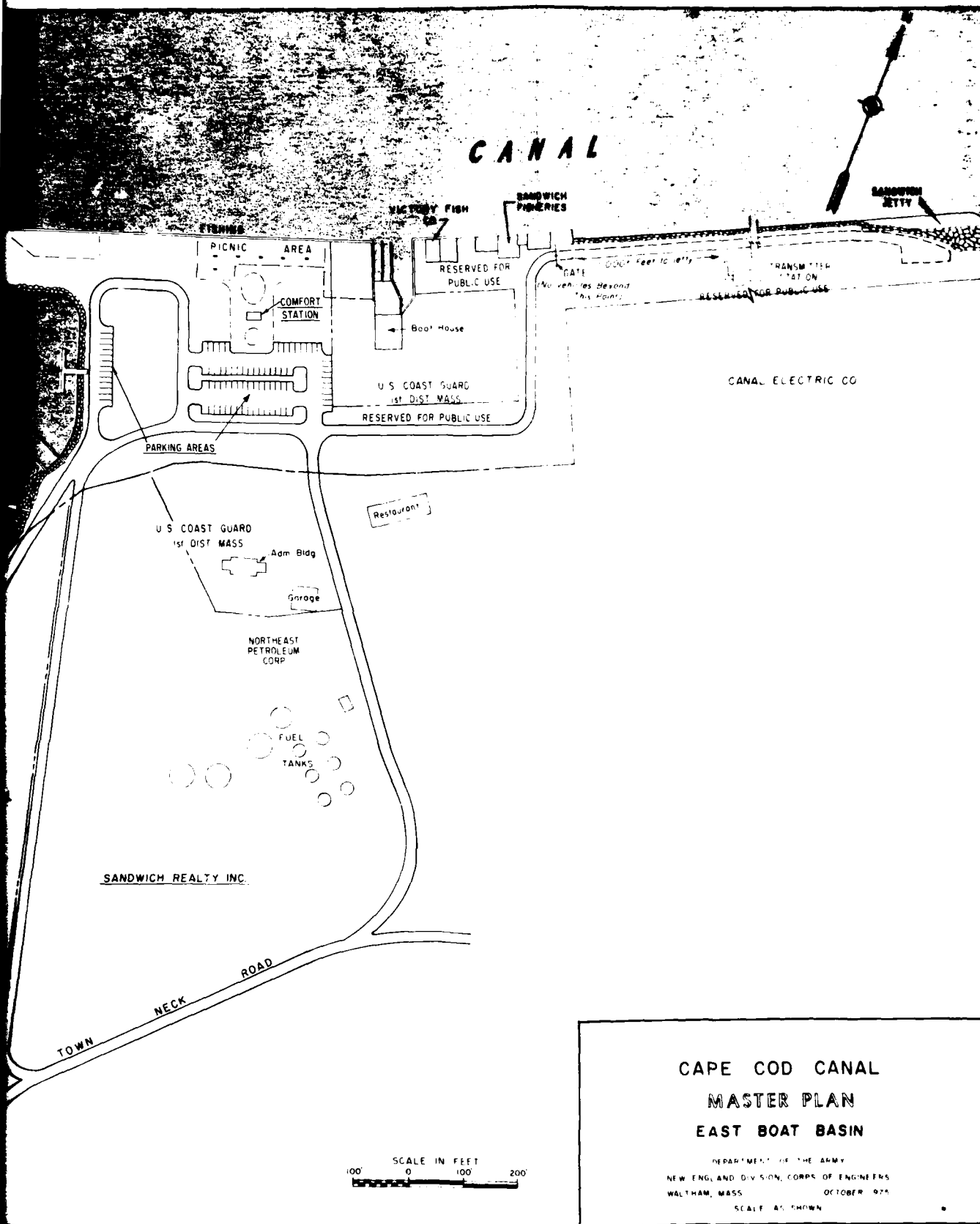
SCALE AS SHOWN

1" = 400'

400' 800'

PLATE NO. 4





APPENDIX A

Although there are no known archeological resources on Federal property near the Cape Cod Canal, the State Archeologist, Maurice Robbins, has pointed out that several known archeological sites do exist in the general area. The location of any other sites are presently unknown. Any items of archeological significance that are discovered on Federal land in the course of construction or maintenance activities shall be undisturbed and carefully preserved until the proper State and Federal authorities are notified. The Federal action in such cases is governed by the following laws:

- a. Public Law 59-209, Antiquities Act of 1906 (34 STAT 225).
- b. Public Law 74-292, Historic Sites Act of 1935 (49 STAT 666).
- c. Public Law 89-655, National Historic Preservation Act of 1969 (80 STAT 915).
- d. Public Law 91-190, National Environmental Policy Act of 1969 (83 STAT 852).
- e. Public Law 93-291, Preservation of Historic and Archeological Data (88 STAT 174) - amending Public Law 86-523, the Reservoir Salvage Act of 1960 (74 STAT 220).
- f. Executive Order 11593, Protection and Enhancement of the Cultural Environment, 13 May 1971 (36 F.R. 8921, 15 May 1971).
- g. National Register of Historic Places 1975, (F.R. 4 Feb 1975, Vol 40, No. 24, published annually and supplemented on the first Tuesday of each month.

DATE
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